



Missouri Department of Natural Resources

Missouri Department of Natural Resources

Regulatory Impact Report

In Preparation for Proposing

An Amendment to 10 CSR 20-7.031, Missouri Water Quality Standards

Division/Program: Division of Environmental Quality, Water Protection Program

Rule number: 10 CSR 20-7.031 **Rule title:** Water Quality Standards

Type of rule action: *Amendment to Existing Rule*

Nature of the rulemaking: *Affects environmental conditions, prescribes environmental standards, administrative, and other conditions*

Approval of the Completed Regulatory Impact Report:

John Madras
Program Director

6/3/11
Date

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Applicability: Pursuant to Section 640.015 RSMo, “all rulemakings that prescribe environmental conditions or standards promulgated by the Department of Natural Resources...shall... be based on the Regulatory Impact Report...” This requirement shall not apply to emergency rulemakings pursuant to Section 536.025 or to rules of other applicable federal agencies adopted by the department “without variance.”

Determination: The department has determined this rulemaking prescribes environmental conditions or standards and verifies that this rulemaking is not a simple unvarying adoption of rules from other federal agencies. Accordingly, the department has produced this Regulatory Impact Report (RIR) which will be made publicly available for comment for a period of at least 60 days. Upon completion of the comment period, official responses will be developed and made available on the agency web page prior to filing the proposed rulemaking with the Secretary of State (SOS). Contact information is at the end of this RIR.

1. Description of the environmental conditions or standards being prescribed

This rulemaking includes revisions that ensure that state water quality standards (WQS) are functionally equivalent to federal standards and that improve the clarity, specificity and effectiveness of the WQS. In summary, the revisions include the following:

- a) Clean Water Act Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:**
With this rulemaking, the department is proposing to apply “fishable/swimmable” use designations to currently unclassified waters as required by Section 101(a) of the federal Clean Water Act (CWA). This action is in response to a September 8, 2000 letter from the U.S. Environmental Protection Agency (EPA) notifying the department of the deficiency. This action also addresses a Missouri Coalition for the Environment lawsuit against EPA to establish “fishable/swimmable” use designations in the state. The centerpiece of the proposal is to designate all perennial rivers and streams and intermittent streams with permanent pools, and all waters spatially represented by the 1:100,000 scale National Hydrography Dataset (NHD) extent, for warm-water aquatic community, human health protection, whole body contact recreation (WBC) category B, secondary contact recreation (SCR), livestock and wildlife protection, irrigation and aesthetic uses. The department will maintain a geospatial dataset and associated list of water bodies that receive these designations and work with stakeholders to develop an aquatic life use attainability analysis (UAA) protocol to move waters into and out of aquatic community designations. Due to the addition of a new Section (2) “Designation of Uses” to the rule, subsequent sections and references in the rule were updated. The definition of “waters of the state” at 10 CSR 20-7.031(1)(AA) was also revised to clarify that manmade treatment systems and structures are not included in the definition.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

Designated use definitions are proposed to be revised to more accurately protect aquatic communities (fish and invertebrates) rather than fisheries, to better reflect the intent and purposes of the federal CWA. Additional clarification was made to the cold-water aquatic community designations to allow for protection of naturally reproducing salmonids (trout) populations in the state and to take advantage of the proposed expanded dissolved oxygen (DO) criteria. Additional clarification was also made to the previously named “limited warm water fishery”, now named “modified aquatic community”, to more closely tie the use designation to aquatic community attainability through UAA rather than geology and physiography. New use designations are added to the rule at the request of Missouri Department of Conservation (MDC) for exceptional aquatic community protection (e.g., threatened and endangered species) and by the department for aesthetics which will allow for better implementation of the general criteria found in rule.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

Minor revisions are proposed to the rule language to better clarify the early life stages of aquatic organisms. The department is collaborating with MDC to develop an aquatic community approach to determine when early life stages are present and absent when applying numeric water quality criteria for DO (Table A3) and chronic ammonia (Tables B2 and B3).

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

Rule language is proposed to be added to the WQS that provide the basis for recommending variances to WQS when standards are not achievable through traditional regulatory approaches. These changes should streamline and improve the efficiency and effectiveness of the variance process.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

The department reviewed and incorporated the latest version of federally developed water quality criteria, as required by Section 304(a) of the federal CWA. These revisions result in the addition of new criteria for the protection of aquatic life, human health protection, and drinking water supply. Changes in the layout and format of the existing water quality criteria table (Table A) are needed in order to accommodate the Section 304(a) criteria revisions.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

The department is proposing revised numeric water quality criteria for phenol, in response to an October 12, 2010 petition to the Missouri Clean Water Commission (MCWC) by Associated Industries of Missouri. The new phenol criteria are based upon established toxicity and criteria development methodologies developed by EPA in “Revised National Recommended Water Quality Criteria for the Protection of Human Health: Final Criteria for Acrolein and Phenol” (EPA 822-F-09-001) and “Quality Criteria for Water – 1986” (EPA 440-5-86-001). The new phenol criteria can be found in Table A1 of the proposed rule and should satisfactorily address the petition before the MCWC.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

The department is proposing revised numeric water quality criteria for sulfate and chloride, in response to a February 5, 2010 petition to the MCWC by the Missouri Agribusiness Association. The new sulfate and chloride criteria are based upon new toxicity and criteria development methodologies as promulgated and approved in the State of Iowa by EPA. The new sulfate and chloride criteria can be found in Table A2 of the proposed rule and should satisfactorily address the petition before the MCWC.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

The department is proposing additional DO criteria for the protection of aquatic communities. The new DO criteria are based upon established criteria and methodologies developed by EPA and found in the federal Section 304(a) guidance “Ambient Water Quality Criteria for Dissolved Oxygen” (EPA 440-5-86-003). The criteria being proposed are similar to those promulgated in other states and will provide the department flexibility in implementing and assessing the criteria for protection of aquatic communities. The new DO criteria can be found in Table A3 of the proposed rule.

i) Designation of La Barque Creek, Jefferson County as an Outstanding State Resource Water [10 CSR 20-7.031, Table E]:

The department reviewed all readily available data and information to determine whether La Barque Creek in Jefferson County qualifies for designation as an Outstanding State Resource Water (OSRW) per 10 CSR 20-7.031(8), in response to a November 3, 2010 presentation by Friends of La Barque Creek before the MCWC. The department has determined that La Barque Creek in Jefferson County qualifies for the OSRW designation and has proposed a 5.5-mile segment for inclusion in Table E of the rule. A public meeting regarding the OSRW designation will be held within the La Barque Creek watershed during the rulemaking process to gather comments on the proposal.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

Eight lakes managed by MDC are proposed to be added to the classified lakes table (Table G) in rule, at the request of MDC. The addition of these lakes to Table G will ensure appropriate protection of these waters. In addition to the eight lakes managed by MDC, 38 other lakes with existing uses are also being added to Table G.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

These proposed changes will make the use designations consistent with the waters' ability (or inability) to support WBC or SCR as determined through the review of UAAs. This action includes adding WBC use to 23 stream segments where this use is attainable, designating SCR to 221 stream segments where existing SCR uses were observed, and removing the WBC use on 111 stream segments where this use is unattainable. For a summary of the department's findings from the UAA reviews, see “Results of Recreational Use Attainability Analyses, May 4, 2011” referenced in Appendix A.

l) Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

With this rulemaking, the department is responding to EPA’s October 29, 2009 decision that new or revised standards (i.e., standards supporting WBC) are necessary to meet the requirements of the federal CWA for the 28.6-mile segment of the Mississippi River from North Riverfront Park to the confluence with the Meramec River. The department reviewed all readily available and applicable data and information, including UAA, water quality studies, and the EPA and department administrative records on the subject. After reviewing the central and supplemental information and data, the department has preliminarily drafted the rule to reflect SCR as the designated use for the 28.6-mile segment of the Mississippi River from North Riverfront Park to the confluence with the Meramec River, with the added provision that bacteria criteria sufficient to support the WBC-Category B use be applied to the water body. This is captured in the draft rule at 10 CSR 20-7.031(5)(C) and Table H. Additional details and rationale can be found in the document “Recommendation Regarding Whole Body Contact Recreation Use Designation for the Mississippi River (Water Body ID: 1707), North Riverfront Park to Confluence with Meramec River, Missouri Department of Natural Resources, Division of Environmental Quality, Water Protection Program, March 10, 2011.

The department has drafted the rule in this way in order to capture the worst case scenario in terms of cost for the Regulatory Impact Report. As the department moves forward with this rule, it will be accepting additional data and information that may change the preliminary draft. Additional data and information must address one or more of the UAA factors at 40 CFR 131.10(g). The department will review any additional data and information received and revise the draft rule as appropriate.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

Further improvements in the delineation of the start and end points of water body segments using more accurate geographic information system (GIS) data is proposed to be incorporated in Tables G and H of the WQS. These improvements will ensure accurate information and data are applied to existing water body segments and those proposed as part of the CWA Section 101(a) use designations.

n) Correction of Typographical Errors:

These changes correct several typographical errors discovered after the effective date of the last revisions to the WQS in 2009.

2. Report on the peer-reviewed scientific data used to commence the rulemaking process

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

Through Missouri’s Water Protection Forum, the department convened a stakeholder group to gather input and ideas regarding application of CWA Section 101(a) use designations to currently unclassified waters. The Water Classification Workgroup convened in September 2009 and held five workgroup meetings through April 2010. The workgroup considered all readily available and applicable peer-reviewed scientific data and posted results and information to the website listed below. The centerpiece of the current use designation proposal (i.e., all perennial rivers and streams and intermittent

streams with permanent pools and those waters spatially represented by the 1:100,000 scale NHD) arose from the Water Protection Forum and other stakeholder discussions that included agricultural, industry and municipal representatives. The draft rule language presented at the citation for this action was developed in cooperation with these stakeholders as well as state and federal wildlife and regulatory agencies. Information on the Water Classification Workgroup can be found on the web at the link below.
<http://www.dnr.mo.gov/env/wpp/cwforum/adv-uncl-waters-wetlands.htm>

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

Through the Water Protection Forum, the department convened a stakeholder group to gather input and ideas regarding revisions to use designation definitions found in rule. The current use designation definition proposal arose from the Water Protection Forum and other stakeholder discussions that included agricultural, industry and municipal representatives. Examples from other state WQS were used as reference when drafting the use designation definitions being proposed. The draft rule language presented at the citation for this action was developed in cooperation with these stakeholders as well as state and federal wildlife and regulatory agencies. Information on the Water Classification Workgroup can be found on the web at the link in 2a above.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

The clarifying revisions to the “Early Life Stages” definition at the citation above were drafted in cooperation with MDC, the wildlife management and conservation agency in the state. The expertise, experience and insight of MDC’s fisheries staff in assisting the department with drafting clarifying revisions to the rule can be considered peer-reviewed as MDC staff are experts in the field of aquatic biology and species life stages. MDC will also be assisting the department with developing an aquatic community approach to determine when early life stages are present and absent when applying numeric water quality criteria for DO (Table A3) and chronic ammonia (Tables B2 and B3). The sources of information to develop this approach will include examples from other states and peer reviewed studies, information and data relevant to Missouri (e.g., MDC fishery and aquatic databases, “Fishes of Missouri” by Pflieger, W.L., “Missouri Naiades: A Guide to the Mussels of Missouri” by Oesch, R.D., etc).

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

The proposed variance authorizing provision rule language was developed following review and analysis of similar rule language from other state WQS. In addition, procedural guidelines provided by EPA for establishing variances from WQS were considered during the review. These documents are available in the appendices to this report.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

Recommended revisions to federally developed Section 304(a) criteria are supported by “National Recommended Water Quality Criteria, EPA, Office of Water (4304T), 2009” and “2011 Edition of the Drinking Water Standards and Health Advisories, EPA 820-R-11-002, EPA, Office of Water, January 2011”. These documents, which contain or reference supporting peer-reviewed information and science, are available from the web at the links below.

<http://water.epa.gov/scitech/swguidance/standards/current/upload/nrwqc-2009.pdf>

<http://water.epa.gov/action/advisories/drinking/upload/dwstandards2011.pdf>

- f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:**
Recommended revisions to water quality criteria for phenol are supported by “National Recommended Water Quality Criteria, EPA, Office of Water (4304T), 2009” and “2011 Edition of the Drinking Water Standards and Health Advisories, EPA 820-R-11-002, EPA, Office of Water, January 2011”. These documents, which contain or reference supporting peer-reviewed information and science, are available from the web at the links found in response 2e above. In addition, the water quality criteria document “Quality Criteria for Water 1986, EPA 440-5-86-001, EPA, Office of Water, May 1, 1986” was used. This document, which also contains or references supporting peer-reviewed information and science, is available from the web at the link below.

<http://www.epa.gov/waterscience/criteria/library/goldbook.pdf>

- g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:**
Recommended revisions to water quality criteria for sulfate and chloride are supported by information and science reviewed by the Iowa Department of Natural Resources (DNR) and EPA as part of the State of Iowa’s WQS review. The document from Iowa DNR, “Water Quality Standards Review: Chloride, Sulfate and Total Dissolved Solids, February 2009” was used to develop the proposed sulfate and chloride revisions to 10 CSR 20-7.031, Table A2. This document, which contains or references supporting peer-reviewed information and science, and an informational document on the criteria revisions are available from the web at the links below.

http://www.iowadnr.gov/water/standards/files/ws_review.pdf

http://www.iowadnr.gov/water/standards/files/ws_fact.pdf

- h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:**
Recommended revisions to water quality criteria for DO are supported by “Ambient Water Quality Criteria for DO, EPA 440-5-86-003, EPA, Office of Water, April 1986”. This document, which contains or references supporting peer-reviewed information and science, is available from the web at the link below.

<http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=00001MSS.txt>

- i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:**
The recommendation to designate La Barque Creek in Jefferson County as an OSRW is supported by information and data supplied by Friends of La Barque Creek during the November 3, 2010 MCWC Meeting in Jefferson City, Mo. The recommendation is also supported by water quality, land use/land cover, geographic, and other peer-reviewed information and data found in the department’s water quality and GIS databases.

Information and data used to support the OSRW designation are available in the appendices to this report and the rulemaking administrative record.

j) Addition of Missouri Department of Conservation and Other Lakes [10 CSR 20-7.031, Table G]:

The recommendation to add eight MDC Lakes to Table G is supported by information and data from MDC and the department. The recommendation to add 38 other lakes to Table G is supported by information and data from the department. The location and size of these lakes was derived from GIS and other peer-reviewed data as found in MDC and department water quality and GIS web sites, databases and publications.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

A UAA is a structured scientific assessment of the factors affecting the attainment of the use, which may include physical, chemical, biological and economic factors. Each UAA contains information for assessing attainability of the WBC or SCR use. Relevant information included evidence of an existing WBC or SCR use and/or the measured depths of the water in accordance with the *Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol* dated December 19, 2007. The data were evaluated through an Internal Review Committee. The collective recommendation of the committee was documented in an Internal Review Committee Recommendation. Persons can review the data gathered during the UAAs and the Internal Review Committee Recommendations on the department's UAA web page at the link below.

http://www.dnr.mo.gov/env/wpp/wqstandards/uaa/uaa_county.htm

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

In order to make a preliminary draft rule regarding whether new or revised standards are needed for the 28.6-mile segment of the Mississippi River from North Riverfront Park to the confluence with the Meramec River, the department reviewed all readily available and applicable data and information. The centerpiece of the department's review included two WBC UAA studies submitted to the department in July 2005 and October 2007 by MEC Water Resources (now Geosyntec Consultants) on behalf of the Metropolitan St. Louis Sewer District (MSD). Additional supplemental data and information included reports entitled "Mississippi River Data" prepared by Tetra Tech, Inc. (October and December 2007); a 2010 report by the United States Geological Survey (USGS) investigating occurrence and sources of *E. coli* in St. Louis streams; EPA's October 2009 letter of determination to the department; as well as a number of supporting documents supplied by EPA, and by Geosyntec Consultants on behalf of MSD. Information and data collected for the UAAs, reports and studies were obtained using quality assurance and quality control procedures where applicable and can be considered peer-reviewed information and data. Information and data used to support the draft rule are available in the appendices to this report and the rulemaking administrative record.

As the department moves forward with this rule, it will be accepting additional data and information that may change the preliminary draft. Additional data and information must

address one or more of the UAA factors at 40 CFR 131.10(g). The department will review any additional data and information received and revise the draft rule as appropriate.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

These revisions involve the use of GIS information and data to clarify or correct water body segment identifications within the WQS. The GIS information and data used to revise water body segment delineation and mileages is peer-reviewed prior to publication and distribution. No additional scientific analyses or data were used in making these revisions.

n) Correction of Typographical Errors:

No scientific analyses or data were involved in the identification or correction of typographical errors.

3. Description of the persons who will most likely be affected by the proposed rule, including persons that will bear the costs of the proposed rule and persons that will benefit from the proposed rule

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

Missouri's WQS currently contain approximately 25,025 miles of stream designated for CWA, Section 101(a) "fishable/swimmable" uses. The proposal to use the 1:100,000 scale NHD would apply these default use designations to an additional 84,845 miles of stream (109,870 miles total). Domestic sewage treatment facilities that discharge to stream segments where WBC or SCR are designated may be affected by this rule. Some facilities may be exempt from disinfecting effluent because a UAA has demonstrated that the WBC use is not attainable and the facility can achieve effluent limits protective of SCR. Other facilities will be required to disinfect because a UAA has not been conducted, a UAA has demonstrated the attainability or existence of WBC use or the existence of SCR use in the receiving stream requires disinfection. Because current facility operating permit procedures protect aquatic communities to the chronic toxicity level, no change is anticipated or additional effluent limitations required due to default designation of aquatic community protection uses.

Nonpoint source contributions of bacteria include overland flow from wildlife and livestock production as well as from urban nonpoint sources. Nonpoint source contributions may be controlled through incentive programs that promote Best Management Practices (BMPs) and environmental awareness. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) and the department's Soil and Water Conservation Program (SWCP) are major sponsors of this effort. The EPA and the department, through Section 319 grants, can also provide funding and expertise to reduce or eliminate bacteria from wildlife, livestock, and urban sources. Because the extent and magnitude of nonpoint source driven bacteria impairments is not known, it is difficult to estimate the cost of voluntary, incentive-based BMPs that may be needed. It is also difficult to predict how much funding will be available at the state and federal level to sponsor BMPs and other projects that aim to reduce bacteria pollution from nonpoint sources.

The other principle source of nonpoint source bacteria loading is urban runoff. As with agriculture, runoff from certain urban activities is not regulated except in metropolitan areas covered by municipal separate storm sewer system (MS4) permits. Urban stormwater may contain significant amounts of bacteria from pet waste and wildlife. Educational and outreach programs work to improve pet care and wildlife management strategies that reduce bacteria loading. Stormwater runoff from urban areas is regulated by the MS4 permit. There are 152 municipalities in Missouri that are required to manage their stormwater runoff under Phase II of the National Pollutant Discharge Elimination System (NPDES) permits. Because bacteria data for receiving streams within the permitted area of these MS4s is lacking, the extent and impact of bacteria loading on these receiving streams is unknown.

Persons benefiting from the rule amendment would be those who enjoy recreational activities in the streams on which the rule amendment designates a recreational use. The bacteria standards that would apply to these designated waters would serve to protect the health of the persons recreating in the streams.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The proposed revisions to use designation definitions have no expected effect, monetarily (such as costs or benefits) or otherwise, on any person. The revisions to aquatic life protection uses transition the standards from a sport fishery-based to an aquatic community-based approach and allow for better definition and designation of Missouri's unique and diverse aquatic assemblages. Because water quality criteria protective of aquatic life uses are based upon aquatic community toxicity data (i.e., fish, macroinvertebrate, and mussel), no adjustments to criteria will need to be made. The addition of an exceptional waters use designation will allow for greater recognition and protection of those waters with exceptional water quality or diversity of unique, sensitive, threatened or endangered species. The addition of an aesthetics use designation provides a linkage between water body designated uses and the general criteria currently found rule. This addition will allow for clarity of use attainment during water quality assessment (i.e., 303(d) listing) and restoration (i.e., Total Maximum Daily Load) activities.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

The proposed revisions to the “early life stages” definition have no expected effect, monetarily (such as costs or benefits) or otherwise, on any person. The revisions and accompanying technical information and guidance are expected to provide more clarity regarding when early life stages of aquatic life occur. Such clarity will allow for appropriate application of the DO and ammonia criteria found in rule.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

A variance from WQS is a temporary modification to a WQS (i.e., designated use, criteria or condition) that would otherwise apply. Variances limit the applicability of specific components of a WQS and provide for alternative designated uses, criteria or conditions to be met during the term of the variance. The addition of variance authorizing provisions in rule will provide a more effective and efficient procedure for recommending variances to WQS when standards are not achievable through traditional

regulatory approaches. Once variance authorizing provisions are included in state rule and approved by EPA, individual variances from WQS would no longer need to be submitted to EPA for review and approval. This reduction in administrative burden would benefit both the state and individual permittees that may seek these variances. Permits with variances could be issued more quickly and reasonable progress toward water quality goals would still be made. Permittees would gain additional flexibility and time to meet water quality goals without violating Section 402(a)(1) of the CWA, which states that permits must be issued to meet applicable WQS. Because variances are time-limited and require public participation, variances from WQS would be periodically reviewed as to their applicability through the triennial review process and presented to the MCWC for approval.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

Facilities that treat wastewater effluent containing the Section 304(a) numeric water quality criteria being added or revised may be affected by the proposed changes. A list of the number of facilities having permits with the pollutants being added or revised can be found in Appendix A – Supporting Documents. The effect of the proposed rule on each facility depends on the type of treatment system, the levels of the pollutant in the wastewater and in the receiving stream, and the applicability of anti-backsliding requirements. Because these factors are unique to each facility and are unknown at this time, the department is unable to determine from this list which facilities would be affected (positively or negatively) from this rule or to what extent.

The new or revised CWA Section 304(a) numeric water quality criteria being proposed were developed and promulgated at the federal level. This action seeks to make Missouri's WQS equivalent to federal standards for these criteria.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

Facilities that treat wastewater effluent containing phenol may be affected by the proposed changes. Because the proposed revision will raise the water quality criteria for phenol, persons who treat their wastewater for this pollutant may see some economic relief where modifications to the treatment are allowed. A survey of the Missouri Clean Water Information System (MoCWIS) resulted in a count of 20 site-specific permits where phenol is an effluent limitation. The effect of the proposed rule on each facility depends on the type of treatment system, the levels of the pollutant in the wastewater and in the receiving stream, and the applicability of anti-backsliding requirements. Because these factors are unique to each facility and are unknown at this time, the department is unable to determine from this list which facilities would be affected (positively or negatively) from this rule or to what extent. However, because the criteria are less stringent than currently found in rule, it is anticipated that the revisions will result in positive impacts to permitted facilities with regard to wastewater treatment and monitoring.

The revised water quality criteria for phenol being proposed were developed and promulgated at the federal level. This action seeks to make Missouri's WQS equivalent to federal standards for this pollutant.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

Facilities that treat wastewater effluent containing sulfate and chloride may be affected by the proposed changes. Because the proposed revision will raise the water quality criteria for sulfate and chloride, persons who treat their wastewater for these pollutants may see some economic relief where modifications to the treatment are allowed. A survey of MoCWIS resulted in a count of 5 site-specific permits where sulfate is an effluent limitation. No general or stormwater permits were found to be affected by the sulfate water quality criteria revision. A separate survey of MoCWIS resulted in a count of 2 site-specific permits, 19 general permits and 30 stormwater permits where chloride is an effluent limitation. The effect of the proposed sulfate and chloride revisions on each facility depends on the type of treatment system, the levels of the pollutant in the wastewater and in the receiving stream, and the applicability of anti-backsliding requirements. Because these factors are unique to each facility and are unknown at this time, the department is unable to determine from this list which facilities would be affected (positively or negatively) from this rule or to what extent. However, because the criteria for sulfate and chloride are less stringent than currently found in rule, it is anticipated that the revisions will result in positive impacts to permitted facilities with regard to wastewater treatment and monitoring.

The revised water quality criteria for sulfate and chloride being proposed were developed and are supported in Iowa's WQS by EPA. It is anticipated the proposed water quality criteria may, in the future, become new federal Section 304(a) criteria for these pollutants. In the interim, the proposed sulfate and chloride criteria represent the best science and information available from which to promulgate revised numeric water quality criteria in Missouri's WQS.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

Facilities that treat wastewater effluent containing oxygen demanding substances (e.g., biochemical oxygen demand, or BOD) may be affected by the proposed changes. A survey of MoCWIS resulted in a count of 61 site-specific permits that contain DO effluent limits. The effect of the proposed DO revisions on each facility depends on the type of treatment system, the levels of the pollutant in the wastewater and in the receiving stream, and the applicability of anti-backsliding requirements. Because these factors are unique to each facility and are unknown at this time, the department is unable to determine from this list which facilities would be affected (positively or negatively) from this rule or to what extent. However, because the DO criteria are expanded from what is currently in rule, it is anticipated that the revisions will result in positive impacts to permitted facilities with regard to wastewater treatment and monitoring.

Additional DO criteria in rule will result in additional flexibility for the department when assessing and establishing effluent limitations protective of DO criteria in-stream. It is also anticipated that false impairment listings for DO will decrease as additional DO criteria will be available in rule from which to better determine attainability. The water quality criteria for DO being proposed were developed and promulgated at the federal level. This action seeks to make Missouri's WQS equivalent to federal standards for this criteria.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

Existing wastewater treatment and stormwater facilities in the watershed should not be affected by the proposed designation of La Barque Creek as an OSRW. A survey of MoCWIS resulted in a count of 4 permitted facilities within the La Barque Creek watershed: Winterwood Subdivision Wastewater Treatment Facility (WWTF) (MO-0124036), St. Joseph's Hill Infirmary (MO-0081426), Wintergreen Development (MO-R10A301) and Jefferson County MS4 (MO-R040052). Because these facilities exist within the watershed at the time of the OSRW designation, discharges can continue as currently permitted provided these discharges do not cause the current water quality in the stream to be lowered. New or expanded discharges to the watershed may be affected by the proposed designation as these discharges will only be permitted if the requirements of 10 CSR 20-7.015(6)(B)(1) and the limitations in 10 CSR 20-7.015(8) are not exceeded. The level of treatment proposed for new or expanded facilities is difficult to determine at this time therefore impacts cannot be estimated.

Persons benefiting from the rule amendment would be those who enjoy the recreational, scientific and educational opportunities that are provided by La Barque Creek. The proposed rule amendment to designate La Barque Creek as an OSRW would offer an enhanced level of protection to the water body and would protect the unique biological diversity found in the stream.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

WWTFs that discharge nutrients (i.e., nitrogen and phosphorous) within the watersheds of the eight MDC lakes and 38 other lakes to be included in Table G may be affected by this rule. A table of the lakes to be added to Table G, and the number of WWTFs within their respective watersheds, is provided in Table 3.1 below.

Table 3.1: Lakes and number of facilities that may be affected

WBID	Water Body Name	Class	Acres	County	Facilities	MDC
7603	Bear Creek Watershed Lake X-5	L3	28.0	Scotland	0	
7620	Bee Run Lake No. 1	L3	6.0	St. Francois	0	
7621	Bee Run Lake No. 2	L3	4.0	St. Francois	0	
7622	Bee Run Lake No. 3	L3	6.0	St. Francois	0	
7600	Boulder Lake	L3	13.0	Lewis	0	
7627	Busch W.A. No. 37 Lake	L3	30.0	St. Charles	0	
7497	Cedar Hill Lake No. 2	L3	11.2	Jefferson	0	
7554	Cedar Hill Lake No. 3	L3	1.6	Jefferson	0	
7555	Clarence Cannon Memorial Watershed Structure No. 1 Reservoir	L3	23.2	Lincoln	0	
7464	Clear Lake	L3	12.5	Jefferson	0	
7495	Cypress Lake	L3	88.0	Stoddard	0	X
7559	Deer Run Lake	L3	0.0	Madison	0	
7558	Flat Rock Lake	L3	17.2	Jefferson	0	
7604	Garfield Lake	L3	12.0	Audrain	3	
7626	Giessing Lake	L3	4.0	St. Francois	0	X
7619	Goff Spring Lake	L3	13.0	St. Francois	0	

Table 3.1 (cont.): Lakes and number of facilities that may be affected

WBID	Water Body Name	Class	Acres	County	Facilities	MDC
7601	Granite Lake	L3	8.0	Lewis	0	
7623	Incline Village Lake	L3	171.0	St. Charles	34	
7496	Jerry P. Combs Lake	L3	149.0	Dunklin	0	X
7553	Jo Lee Lake	L3	8.0	St. Francois	0	
7616	Lac Benet Lake	L3	7.0	St. Francois	0	
7607	Lac Bergerac	L3	6.0	St. Francois	0	
7610	Lac Bourbon	L3	6.0	St. Francois	0	
7618	Lac Calista	L3	5.0	St. Francois	0	
7605	Lac Carmel	L3	54.0	St. Francois	0	
7615	Lac Catalina	L3	5.0	St. Francois	0	
7609	Lac Darcie	L3	4.0	St. Francois	0	
7617	Lac Lafitte	L3	34.0	St. Francois	1	
7614	Lac Marseilles	L3	44.0	St. Francois	0	
7608	Lac Michel	L3	7.0	St. Francois	0	
7611	Lac Renee	L3	4.0	St. Francois	0	
7606	Lac Shayne	L3	13.0	Washington	0	
7613	Lac Tiffany	L3	5.0	St. Francois	0	
7612	Lac Veron	L3	2.0	St. Francois	0	
7469	Lake Buteo	L3	6.9	Johnson	0	
7482	Lake Ocie	L3	61.6	Ste. Genevieve	1	
7498	Mineral Area College Quarry Pond	L3	2.0	St. Francois	0	X
7557	Mononame 846 Lake	L3	3.2	Crawford	0	
7499	Pim Lake	L3	7.0	St. Francois	0	X
7602	Quartz Lake	L3	5.0	Lewis	0	
7500	Rotary Lake	L3	5.0	Cape Girardeau	0	X
7502	Simpson Park Lake	L3	63.7	St. Louis	9	
7466	Spring Lake	L3	5.3	Jefferson	0	
7625	Thomas Lake	L3	3.0	St. Francois	0	X
7624	Tri-City Lake	L3	27.0	Boone	0	
7501	Valley Water Mills Pond	L1	14.0	Greene	34	X

Of the 46 lakes to be added, only 20 have watershed areas greater than 10 acres, the threshold for application of numeric nutrient criteria for nitrogen and phosphorous. Within this subset of lakes, only 6 lake watersheds have facilities that may discharge nutrients and be affected by the proposed rulemaking. The probability of any of these facilities receiving new limits on nutrients will depend on the trophic condition of the lakes within their watersheds, and the distance between their outfalls and the receiving lake. Because nitrogen and phosphorous water quality data are not available for any these lakes, an assessment of compliance with the nutrient criteria that would apply can not be made at this time. For this reason, the impact that classification may have on these lakes with regard to nutrient criteria cannot be estimated. One of the lakes, Busch Wildlife Area No. 37 Lake, is currently listed as impaired for mercury in fish tissue from atmospheric nonpoint sources. The change in classification for this lake will not have any impact on the impairment designation for mercury since narrative, general criteria were used to assess and list the water body. Since there are no point source discharges of mercury in the watershed, no economic impact is expected for permitted facilities.

The most widespread nonpoint source contributor to nutrient loading of lakes and reservoirs is row crop agriculture. Row cropping occurs primarily in the glaciated and Osage plains regions of the state. Processes of nutrient loading include overland flow and soil erosion. Other forms of agriculture, particularly livestock production, are likely significant contributors. The other principle source of nonpoint source nutrient loading is urban runoff. As with agriculture, runoff from certain urban activities is not regulated except in metropolitan municipalities covered by MS4 permits. Educational and outreach programs work to improve lawn care management and reduce nutrient loading.

Nonpoint source contribution may be controlled through incentive programs that promote BMPs and environmental awareness. Examples of BMPs include nutrient management plans, reduced tillage, buffer strips along streams, and crop rotations. The U.S. Department of Agriculture's NRCS and the department's SWCP are the major sponsors of this effort. NRCS programs include the Environmental Quality Incentives Program (EQIP), and the Conservation Security Program (CSP). SWCP offers cost-share for specific conservation practices, and the Agriculture Nonpoint Source Special Area Land Treatment (AgNPS SALT) program targets selected watershed areas for land treatment. For lakes and reservoirs that may be in non-compliance with the rule, coordination with these agencies will be essential to addressing the problem. Implementation will, in many cases, be a long-term process. Landowners who participate in these programs can benefit from the BMPs by protecting the soil's productive capacity and using fewer costly chemicals.

Persons benefiting from the rule amendment would be those who enjoy recreational activities on the lakes to which the rule designates aquatic community and recreational uses. The aquatic community and bacteria standards will serve to protect the aquatic communities and the health of the persons recreating in these lakes. In direct economic terms, the greatest beneficiaries from the proposed rule may be owners of lake front property. Several studies have indicated that increased water clarity associated with nutrient reduction is a significant factor in raising the value of such property. (Michael et al., 1996; Wilson and Carpenter 1999). Steinnes (1992), found an average increased value of \$235 per lakeshore lot for each 1 meter increase in water transparency as measured with Secchi disk.

Other economic beneficiaries include businesses that are reliant on tourism related lake recreation, such as restaurants, hotels, and marinas, as well as gas stations near resort areas. Several studies demonstrated relationships between lake water clarity and levels of tourist recreation (Bouwes and Schneider, 1979; Smith et al, 1986; Ribaud and Epp, 1984; Wilson and Carpenter, 1999). In more tangential terms, the public at large will benefit. Drinking water systems that use reservoirs as a source would experience fewer episodes of taste and odor problems that can occur as a consequence of excessive nutrient loading. Furthermore, improved water quality in drinking water reservoirs would lead to a reduction in the cost of treating the water. Protected and enhanced water clarity will maintain and improve opportunities for WBC. And, while some sport fishing potential is enhanced with higher nutrient loading, the potential for greater aquatic biodiversity tends to increase with reduced nutrient loading (Egertson and Downing, 2004).

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

Domestic sewage treatment facilities that discharge to stream segments where WBC and/or SCR use were evaluated through a UAA may be affected by this rule. Some facilities will be exempt from disinfecting the effluent because the UAA demonstrated that the WBC use is not attainable and the SCR does not exist in the receiving stream. Other facilities will be required to disinfect because the UAA demonstrated the attainability of WBC use or the existence of SCR use in the receiving stream.

Persons benefiting from the rule amendment would be those who enjoy recreational activities in the streams on which the rule amendment designates a recreational use. The bacteria standards that would apply to these designated waters would serve to protect the health of the persons recreating in the streams.

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

Domestic sewage treatment facilities and collection system operated and maintained by the Metropolitan St. Louis Sewer District (MSD) will be affected by this rule. Although both the MSD-Bissell Point WWTF (MO-0025178) and MSD-Lemay WWTF (MO-0025151) are in the process of installing disinfection systems to meet SCR bacteria effluent limitations, application of WBC bacteria criteria to this segment will result in increased disinfection costs required to achieve lower bacteria effluent limitations at these facilities. Increased disinfection costs will be particularly evident during periods of high discharge flow when contact time with the disinfection system may be reduced. In addition, combined sewer overflow (CSO) and sanitary sewer overflow (SSO) reduction and elimination strategies found in MSD's Long Term Control Plan (LTCP) will need to be revised and adjusted for the lower WBC bacteria target. Additional improvements would be needed to capture and treat CSO/SSO effluent during the periods these locations are discharging. Cost estimates provided by MSD to comply with WBC bacteria criteria on this segment range from \$1.5–\$2 billion.

Persons benefiting from the rule amendment would be anyone who may recreate on the segment of the Mississippi River from North Riverfront Park to the confluence of the Meramec River as the WBC-Category B bacteria criteria would apply to this segment. However, the department does not believe whole body contact recreation is a safe use of the river in this segment given its physical constraints and high barge traffic and considering safer alternatives for such recreation are available nearby.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The proposed rule will ensure that permits and water quality assessments are supported by an accurate water segment classification system. This accuracy reduces the potential for mistakes in the identification of applicable WQS and, consequently, for these errors to result in inappropriate permit terms and conditions or inaccurate water quality assessments. Avoiding these mistakes will save both time and resources for permit applicants and the department when preparing and reviewing permit applications.

n) Correction of Typographical Errors:

The existing typographical errors could result in some misunderstanding of the standards. This amendment might prevent misunderstandings that could cause delays in decisions based on the sections of the rule affected by the typographical errors.

4. Description of the environmental and economic costs and benefits of the proposed rule

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The proposed revision to apply “fishable/swimmable” use designations to currently unclassified waters is required by Section 101(a) of the federal CWA. Federal regulations at 40 CFR 131 interpret and implement these provisions by requiring that WQS provide for a default use designation of “fishable/swimmable” unless those uses have been shown through a UAA to be unattainable. As a delegated state responsible for implementing federal clean water law requirements, Missouri must adopt the federal requirement for “fishable/swimmable” use designations for waters that currently do not have these uses and for which a UAA has not been conducted. The August 4, 2010 lawsuit filed by the Missouri Coalition for the Environment against EPA, the rationale contained therein, and subsequent actions by both parties to resolve the lawsuit, demonstrate the certainty of the “fishable/swimmable” use designation deficiency in state rule. Therefore, the environmental and economic costs and benefits of these revisions are being determined by actions at the federal and not the state level.

While Section 536, RSMo, does not require a cost and benefit analysis when federal requirements are adopted without modification, this RIR notes that 1,342 facilities might be affected by this revision and that the current proposal may be considered a modification of the federal requirement. As noted in Section 3a above, current facility operating permit procedures protect aquatic communities to the chronic toxicity level. No change is anticipated or additional effluent limitations required due to default designation of aquatic community protection uses. Additional effluent limitations for bacteria (i.e., *E. coli*) may be required due to default designation of recreational protection uses. A list of permitted facilities that may be required to have NPDES permits with limits for bacteria is provided in Appendix A.

Environmental Benefit: The designation of recreational uses to streams and, consequently, the application of a pathogen standard (*E. coli* as an indicator) may require disinfection of effluent before it is discharged to waters designated to this use. The application of the standard through discharge permits will provide greater protection of public health during the recreational use. Persons who recreate in streams that have elevated levels of bacteria through runoff from areas containing livestock may also benefit from this rule. The use designations may place a priority on the use of 319 grants and state/federal cost-share and incentive programs in reducing pathogen levels in streams serving recreational uses.

Environmental Cost: Environmental effects from the proposed use designations might come through the discharge of disinfection by-products when chlorination is used as the disinfection process. Some residual chlorine may enter the receiving water from the disinfection process unless dechlorination processes are required. Dechlorination may also introduce other contaminants, such as trihalomethanes, which may be carcinogenic. Where recreation does occur, the risks to human health from the by-products are less

severe than the risk of infection from non-treated effluent. Where recreation does not occur, the addition of the by-products would be the greater risk to the environment.

Economic Benefit: Economic benefits can be generated by environmental improvements. For example, areas where stream water quality is good can prevent costs such as medical expenses to treat pollution-related illnesses. Streams that support recreation are sometimes an important factor in a local economy, especially where recreation-related services are needed, such as lodging or fee-based camping, canoe or tube rental and food services. An exact quantification of these benefits is not possible without more data on the number of stream users, the illnesses that relate to pathogens already present in the water and the business income that results from the users during recreation. Because most of these streams do not show any evidence of existing recreation use and are small compared to the better known "float streams", any benefits are likely to be only occasional and confined to users who live in the vicinity of the stream.

Economic Cost: Facilities that are required to disinfect their discharges may spend between \$10,000 to \$26,000,000 depending on the size of their treatment system and on the type of disinfection process installed. Tables 4.1 through 4.4 demonstrate various ways to estimate the costs to comply with this rule. These costs are based on standardized rates and may be higher or lower depending on specific conditions at each facility. On the nonpoint source side, the economic cost will depend on the amount of funds directed toward conservation practices and other livestock management initiatives. These costs depend on the presence of volunteers willing to implement conservation practices on private property.

The current number of WWTFs or facilities without bacteria limits that would be affected by this rule was obtained from the department's permits database. All cost estimates have been adjusted to reflect the cost of equipment, installation, and operation and maintenance for calendar year 2004 using the Engineering News Record Construction Cost Index (CCI). The use of either chlorination or an ultraviolet (UV) disinfection system was determined according to the size of a facility's design flow in million gallons per day (MGD).

The tables below show the estimated cost per facility for each of the four size ranges and two types of disinfection systems. Population equivalent (PE) has been presented in addition to design flow to provide supplemental information on population sizes affected should increased user rates result from the need to disinfect the effluent. Table 4.1 shows the number of facilities potentially affected by category of flow and type of disinfection system. Table 4.2 displays installation costs and Table 4.3 shows the operation and maintenance (O&M) costs for these facilities.

Table 4.1: Number of facilities that may be affected

Flow (MGD)	Public		Private		Total
	Chlorination	UV	Chlorination	UV	
Flow less than 0.05 MGD	137	48	544	336	1,065
Flow between 0.05 & 1.0 MGD	174	54	19	17	264
Flow between 1.0 & 20.0 MGD	5	7	1	0	13
Flow greater than 20.0 MGD	0	0	0	0	0
Total	316	109	564	353	1,342

Table 4.2: Installation Cost

Flow (MGD)	Public		Private		Total
	Chlorination	UV	Chlorination	UV	
Flow less than 0.05 MGD	\$1,370,000	\$1,983,840	\$5,440,000	\$13,886,880	\$22,680,720
Flow between 0.05 & 1.0 MGD	\$2,801,400	\$6,323,724	\$305,900	\$1,990,802	\$11,421,826
Flow between 1.0 & 20.0 MGD	\$8,908,245	\$6,804,000	\$1,781,649	\$0	\$17,493,894
Flow greater than 20.0 MGD	\$0	\$0	\$0	\$0	\$0
Total	\$13,079,645	\$15,111,564	\$7,527,549	\$15,877,682	\$51,596,440

Table 4.3: O&M Cost per Year

Flow (MGD)	Public		Private		Total
	Chlorination	UV	Chlorination	UV	
Flow less than 0.05 MGD	\$3,014,000	\$84,000	\$11,968,000	\$588,000	\$15,654,000
Flow between 0.05 & 1.0 MGD	\$23,111,898	\$267,624	\$2,523,713	\$84,252	\$25,987,487
Flow between 1.0 & 20.0 MGD	\$680,100	\$459,116	\$136,020	\$0	\$1,275,236
Flow greater than 20.0 MGD	\$0	\$0	\$0	\$0	\$0
Total	\$26,805,998	\$810,740	\$14,627,733	\$672,252	\$42,916,723

Analytical bacteria testing costs were established by averaging the cost of fecal coliform (FC) (*E. coli* testing data were not available at this time) and total residual chlorine (TRC) testing from ten (10) laboratories in Missouri and neighboring states that serve Missouri facilities. Table 4.4 shows the potential cost due to analytical testing of FC and TRC per each frequency and facility type.

Table 4.4: Total Average Testing Cost per Year

Flow (MGD)	Public		Private		Total
	FC	TRC	FC	TRC	
Flow less than 0.05 MGD	\$44,014	\$22,718	\$172,957	\$67,135	\$306,823
Flow between 0.05 & 1.0 MGD	\$85,880	\$36,050	\$28,919	\$1,710	\$152,559
Flow between 1.0 & 20.0 MGD	\$26,821	\$8,293	\$172	\$108	\$35,394
Flow greater than 20.0 MGD	\$0	\$0	\$0	\$0	\$0
Total	\$156,714	\$67,061	\$202,047	\$68,954	\$494,776

These calculations assume all WWTFs not currently disinfecting will install disinfection when the discharge is within two (2) miles of a classified water body designated for recreation. These calculations do not take into account the cost to future facilities that do not presently

have an operating permit. Additionally, the cost estimate calculations assume that most mechanical WWTs will use UV disinfection while lagoon systems will use chlorination. When UV disinfection is used, dechlorination is not applicable and TRC cost is zero.

The frequency of bacteria testing is specific to each permit that would be affected by the recreational use designation and it is usually based on the facility design flow. It is assumed that facilities of similar size and type will most likely require similar monitoring frequency.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

No significant economic and environmental costs or benefits are expected to result from the addition or revision of use designations. These additions and revisions will result in better accuracy in the identification and designation of beneficial uses. This improved accuracy will increase the efficiency of program activities that require water use designations. The increased efficiency should reduce costs for both the applicants and the department as water body segments will be appropriately protected through application of standards and permit limitations.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

No significant economic and environmental costs or benefits are expected to result from the clarification of the early life stages definition in rule. These revisions will result in better accuracy in the identification and determination of early life stages present or absent in waters of the state. This improved accuracy will increase the efficiency of program activities that require the use of criteria that rely on early life stages to ensure protection of aquatic community use designations. The increased efficiency should reduce costs for both the applicants of discharge permits and the department as permits for discharge are reviewed and issued. Supplemental guidance for determining early life stages, developed in cooperation with MDC, will ensure appropriate protection and propagation of aquatic communities in the state.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

No significant economic and environmental costs or benefits are expected to result from the addition of variance authorizing provisions in rule. The addition will increase the efficiency of program activities that may rely on variances to achieve compliance with WQS. The increased efficiency should reduce costs for both the applicants of discharge permits and the department as permits for discharge and variances are reviewed and approved.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

The proposed revisions to federal 304(a) criteria are in response to changes in EPA guidance regarding establishing appropriate thresholds to prevent toxic effects on aquatic life and human health. An explanation of the basis for the changes in the federal guidance can be reviewed in the “*National Recommended Water Quality Criteria*” published in 2009 by EPA, Office of Water and “*2011 Edition of the Drinking Water Standards and Health Advisories*” published in 2011 by EPA, Office of Water. Missouri is adopting these federal criteria and therefore the environmental and economic costs and benefits are determined by the actions at the federal level and not the state. While

Section 536, RSMo, does not require a cost and benefit analysis when federal requirements are adopted without modification, this RIR notes that 1,623 site-specific permits, 433 general permits and 60 stormwater permits might be affected by these revisions. A list of permitted facilities having NPDES permits with limits for federal 304(a) criteria proposed to be revised is provided in Appendix A.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

The proposed revisions to water quality criteria for phenol are not expected to result in significant economic and environmental costs or benefits. Phenol removal from wastewater treatment discharges has costs that are predominantly dependent on the size of the facility and amount of phenol used or removed from the production process. The RIR has identified 20 site-specific permits that may be affected by the revisions in phenol criteria. Because the revisions result in an increase in the criteria for protection of chronic aquatic communities, it is anticipated that elimination or reduction of treatment costs will be the result of this rule. Increases in criteria result in decreased treatment costs and removal of effluent limitations where reasonable potential to cause or contribute to exceedences of WQS do not exist. The frequency of monitoring for those facilities that retain effluent limitations or monitoring may also be decreased as a result of this rule. Any economic costs or benefits that may be realized are difficult to quantify for the reasons listed in response 3f. No environmental costs or benefits are expected since the criteria are being revised to established federal criteria levels.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

The proposed revisions to water quality criteria for sulfate and chloride are not expected to result in significant economic and environmental costs or benefits. Sulfate and chloride removal from wastewater treatment discharges have costs that are predominantly dependent on the size of the facility and amount of these pollutants used or removed from the production process. The RIR has identified 5 site-specific permits that may be affected by the revisions in sulfate criteria and 2 site-specific permits, 19 general permits and 30 stormwater permits that may be affected by the revisions in chloride criteria. Because the revisions result in an increase in the criteria for protection of chronic aquatic communities, it is anticipated that elimination or reduction of treatment costs will be the result of this rule. Increases in criteria result in decreased treatment costs and removal of effluent limitations where reasonable potential to cause or contribute to exceedences of WQS do not exist. The frequency of monitoring for those facilities that retain effluent limitations or monitoring may also be decreased as a result of this rule. Any economic costs or benefits that may be realized are difficult to quantify for the reasons listed in Response 3g. No environmental costs or benefits are expected since the criteria are being revised to levels that are protective of aquatic community uses as reviewed and approved by federal and state agencies.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

The proposed revisions to water quality criteria for DO are not expected to result in significant economic or environmental costs. The amendment to the rule revises Table A3 of the WQS such that it is in agreement with federal 304(a) criteria for DO. This agreement will present less chance of misinterpretation and misapplication of the criteria by providing additional criteria from which to judge attainment of aquatic community

uses. Economic benefits of the amendment include reductions in wastewater treatment costs for BOD where reductions are not necessary. Waters with healthy aquatic communities will have additional water quality criteria from which to assess compliance with the WQS (i.e., more criteria than an instantaneous minimum) and result in fewer impaired waters listings during 303(d) assessments. Environmental benefits of the amendment include increased protection of cold-water aquatic communities with naturally reproducing salmonid populations that currently do not receive the level of DO protection available by federal criteria.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The proposed designation of La Barque Creek as an OSRW is not expected to result in significant economic or environmental costs at this time. The change in rule would increase the level of protection to La Barque Creek by introducing the requirement that future discharges will not cause current water quality in the stream to be lowered. The option that new discharges could lower the water quality of La Barque Creek, if they demonstrated a socio-economic need that surpassed environmental benefit, would be removed. The environmental benefit that will result from the OSRW designation is that existing water quality in La Barque Creek, and the aquatic life and recreational opportunities that exist in the stream, would be maintained with the highest level of water quality protection available in rule. This improved environmental protection may contribute to economic benefits from enhanced property values and recreational opportunities in the future. The exact extent of economic benefit cannot be determined at this time.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The proposed revision to add MDC and other lakes to Table G of the WQS is not expected to result in significant economic or environmental costs. As detailed in Response 3j, the lack of available water quality data make it difficult to determine whether the lakes being added to Table G have water quality impairments related to nutrients. In the absence of an impairment determination, estimates of costs and their significance become problematic and requirements for nutrient monitoring or wastewater treatment upgrades are unknown at this time. Also, no significant economic or environmental costs are anticipated with respect to the mercury in fish tissue impairment for Busch Wildlife Area No. 37 Lake. Any economic or environmental costs for the listed impairment are a result of exceedence of narrative, general criteria for mercury in fish tissue which occurred when the water body was unclassified. Designation of aquatic community protection, and incorporation of mercury in fish tissue criteria in rule, will not impact the current assessment of the water as impaired. However, future assessments will utilize the new aquatic community use designation and mercury fish tissue criteria.

The economic and environmental benefit of these lakes being added to Table G is more apparent and expected to be positive. Greater protection for lakes and the aquatic resources they provide will result in increased economic and environmental benefit to public and private landowners, businesses and economies within the watersheds of these lakes. While it is difficult to estimate exact economic and environmental benefits, increases in property values and revenues from tourism and recreation are expected to be greater where water quality is protected.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

This action adds WBC use to 23 stream segments where the use is attainable, designates SCR to 221 stream segments where existing SCR uses were observed, and removes the WBC use on 111 stream segments where this use is unattainable. The economic and environmental costs and benefits of recreational use designations as a result of UAAs are similar to those found in Response 4a.

For the 23 stream segments where the WBC use is being added (i.e., designated), 8 of the stream segments are currently unclassified and will be receiving the WBC use designation due to the application of “fishable/swimmable” use designations in rule. Potential costs and impacts for these facilities have already been accounted for in the determination of costs and impacts in Response 4a. The remaining 15 stream segments are currently classified and on or within 2 miles of the spatial extent of the 1:100,000 scale NHD. Because WBC will be designated through “fishable/swimmable” use designations as part of this rulemaking, facilities discharging to these segments have been captured in the RIR estimates of cost for this rule. Where SCR is being designated due to evidence of existing use, the majority of waters affected currently have WBC designated and additional costs for disinfection are not anticipated. For those waters where SCR is being designated, but WBC is recommended to be removed, costs and impacts for disinfection were estimated in the 2005 WQS rulemaking RIR for WBC (RIR for Proposed Rule Amendment, 10 CSR 20-7.031, WQS, October 13, 2004). Waters where WBC is being recommended to be removed should not incur additional costs or impacts related to disinfection.

l) Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

The current draft retains the SCR designation on the 28.6-mile segment of the Mississippi River from North Riverfront Park to the confluence with the Meramec River with the added provision at 10 CSR 20-7.031(5)(C)5 that bacteria criteria sufficient to support the WBC-Category B use be applied to the water body. With this draft, the department is not making a determination that swimming and waterskiing are safe or desirable activities on this water body segment. This draft does not imply that the State of Missouri officially sanctions and endorses swimming and waterskiing in this location. Rather, the department is drafting the rule in this way to reflect the worst case scenario in terms of cost while it gathers additional data and information for the Mississippi River UAAs already submitted which currently do not conclusively demonstrate that WBC uses are unattainable on this water body segment.

Environmental Benefit: The designation of recreational uses to streams and, consequently, the application of a pathogen standard (*E. coli* as an indicator) may require disinfection of effluent before it is discharged to waters designated to this use. The application of the standard through discharge permits and improvement of combined sewer infrastructure in the MSD service area will provide greater protection of public health during any recreational use that may occur. However, the marginal environmental benefit that might be gained by these actions may not be justified given the huge cost to

implement standards that protect a potentially infrequent use. Further documentation is needed for the administrative record if socio-economic factors are to be considered.

Environmental Cost: Environmental cost from the proposed use designations might come through the discharge of disinfection by-products when chlorination is used as the disinfection process. Some residual chlorine may enter the receiving water from the disinfection process unless dechlorination processes are required. Dechlorination may also introduce other contaminants, such as trihalomethanes, which may be carcinogenic. Where recreation does occur, the risks to human health from the by-products are less severe than the risk of infection from non-treated effluent. Where recreation does not occur, the addition of the by-products would be the greater risk to the environment.

Economic Benefit: As detailed in Response 4a, economic benefits can be generated by environmental improvements. However, the actual usage of this segment of the Mississippi River is not known with great certainty, and economic benefits are not easily quantified without detailed information and data on the number of stream users, the illnesses that relate to pathogens already present in the water and the business income that results from the users during recreation. Because the use of this segment is likely extremely small compared to better known "float streams" in the area that support conditions favorable to WBC, any economic benefits are likely to be occasional or infrequent and confined to users who may recreate in this segment of river.

Economic Cost: It has been suggested that the above decision will result in substantial economic cost to MSD and by extension its ratepayers. MSD is currently undertaking over \$2 billion in infrastructure construction and improvement projects to meet the current SCR designation (and accompanying 1,134 col/100 mL *E. coli* bacteria criteria) for this segment of the Mississippi River. Additional improvements will be necessary at the two main WWTFs (MSD-Bissell Point WWTF and MSD-Lemay WWTF) that discharge to the segment as well as major improvements to the combined sewer infrastructure within the service area. Anecdotal cost estimates provided by MSD range from an additional \$1.5–2 billion in order to meet the requirements of the above decision (John Lodderhose, MSD, personal communication). While a UAA assessing social and economic costs has not been conducted under 40 CFR 131.10(g)(6), it has been suggested that reductions in the *E. coli* bacteria criteria for this segment may result in substantial and widespread economic and social impacts to MSD and its ratepayers. Should MSD submit information and data under this factor, the department will review any information and data provided and, if appropriate, will incorporate this information into the administrative record.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

These revisions will result in better accuracy in the identification of lakes and streams. This improved accuracy will increase the efficiency of program activities that require the use of the classification information (e.g., permits, water quality assessments, and total maximum daily loads). The increased efficiency should reduce costs for both permit applicants and the department.

n) Correction of Typographical Errors:

No significant economic and environmental costs or benefits are expected to result from the correction of the typographical errors.

5. Probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenue

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

Missouri's WQS currently contain approximately 25,025 miles of stream designated for CWA, Section 101(a) "fishable/swimmable" uses. The proposal to use the 1:100,000 scale NHD would apply these default use designations to an additional 84,845 miles of stream (109,870 miles total). According to the 2010 Missouri Water Quality Report (Section 305(b) Report), the department spends about \$3.3 million annually on monitoring and analysis of ambient water and related media. Over a two-year water quality assessment cycle, these funds monitor approximately 60 percent of the classified waters in the state. This translates into a cost of approximately \$11 million to monitor all currently classified waters over a roughly six and half year period. The 3.4-fold increase in the amount of waters to be monitored and assessed would not result in any significant economies of scale for the department. Therefore, in order to achieve a similar percentage of waters monitored on future water quality reports, the department's annual monitoring and analysis costs would increase to \$11.2 million. Resource allocations less than this amount would necessarily result in a smaller percentage of waters being monitored and assessed over the assessment cycle.

The proposed revisions would not change the department process for the review of permit applications. Staff would perform reasonable potential analyses and calculate wasteload allocations for water quality-based effluent limits in the same manner as done currently. Bacteria effluent limitations will be added to permits where these limits are required, and will be documented in the permit fact sheet or statement of basis as is current practice. Therefore, no increased costs to the department with respect to permitting are expected from this proposed rule.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The proposed rule revision will lead to more accurate and clear delineations of aquatic community use designations. Establishing accurate use designations ensures the appropriate application of criteria and can eliminate unnecessary regulatory steps and delays in determining effluent limits for permits.

c) Clarification of "Early Life Stages" definition [10 CSR 20-7.031(1)(H)]:

Because this proposed revision is only a clarification, no costs are expected to be created by this action.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

It is unlikely that the proposed addition of variance authorizing provisions in rule will add any significant work or cost to the department or to any other agency. The department currently accepts and processes variance applications in a timely manner. The addition of variance authorizing provisions will increase the efficiency of the process for both the department and permittees. Increased efficiency may translate into reduced costs to the department once the variance authorizing process is in rule and being implemented.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

The proposed revisions would not change the department process for the review of permit applications. Staff would perform reasonable potential analyses and calculate wasteload allocations for water quality-based effluent limits in the same manner as done currently. Although the results of these analyses may be different, the amount of time involved with the effort will be the same. Therefore, no increased costs to the department are expected from this proposed rule.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

The proposed revision would not change the department process for the review of permit applications. Staff would perform reasonable potential analyses and calculate wasteload allocations for water quality-based effluent limits in the same manner as done currently. Although the results of these analyses may be different, the amount of time involved with the effort will be the same. Therefore, no increased costs to the department are expected from this proposed rule.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

The proposed revision would not change the department process for the review of permit applications. Staff would perform reasonable potential analyses and calculate wasteload allocations for water quality-based effluent limits in the same manner as done currently. Although the results of these analyses may be different, the amount of time involved with the effort will be the same. Therefore, no increased costs to the department are expected from this proposed rule.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

This revision would allow additional DO criteria to be considered and would not affect the department's work during water quality assessments or permit reviews. It saves the department from the cost of having to inappropriately place streams on an impaired waters list based on the existing criteria, and consequently, having to address the listing through a standards revision or total maximum daily load (TMDL) at a later time.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

It is unlikely that the proposed classification of this stream as an OSRW will add any significant work or cost to the department or to any other agency. Efforts to preserve the unique diversity of aquatic and terrestrial species within the watershed would continue by the department and MDC regardless of the designation. The designation will enhance protection for the stream and ensure the appropriate application of criteria for the stream.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

It is unlikely that the proposed addition of MDC and other lakes to Table G will add any significant work or cost to the department or to any other agency. Establishing accurate classifications and use designations will ensure appropriate application of criteria and eliminate unnecessary regulatory steps and delays in determining effluent limits for permits.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

It is unlikely that the proposed changes to use designations will add any significant work or cost to the department or to any other agency. Establishing accurate use designations will ensure appropriate application of criteria and eliminate unnecessary regulatory steps and delays in determining effluent limits for permits.

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

It is unlikely that any proposed change to use designations on this segment will add any significant work or cost to the department or to any other agency. Should MSD submit additional data or information in support of the already submitted UAAs, the department will allocate sufficient resources that ensure any submittal is reviewed in a timely manner.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The proposed rule revisions should lead to more consistent and clear delineations of classified waters and therefore increased work efficiency and a reduction of costs for the department.

n) Correction of Typographical Errors:

No costs to the department or any other agency is expected from the correction of the typographical errors.

6. Comparison of the probable costs and benefits of the proposed rule to the probable costs and benefits of inaction, which includes both economic and environmental costs and benefits

One of this state's greatest natural resources is its abundant water. The WQS are designed to protect that resource. If this rulemaking does not become effective, some of those resources will not be protected to the extent required by federal law. In addition, public health might be affected due to the need for revised water quality criteria for adequate protection of aquatic life (fish consumption), recreational uses, and drinking water supplies. Many of these impacts are immeasurable in terms of costs simply because the exact effects from lack of action are incalculable. What price is good health worth? While the potential economic cost explained in Section 4 of this report may be significant for portions of the rulemaking, no comparison can be made to environmental benefits without associating a cost to lowered health of citizens and the diminished resources that this rulemaking is intended to prevent.

The state of the economy depends to some extent on the state of the environment. For example, an area that can advertise good water quality is attractive to many human activities, from tourism to industry.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The costs and benefits of this proposed rule are discussed in Responses 4a and 5a. Costs are generally associated with pollution control activities including disinfection systems

for point sources and BMPs for nonpoint sources. The average yearly cost for operating disinfection systems at domestic wastewater treatment systems, which are the most prevalent point source for bacteria pollution, is shown in Tables 4.3 and 4.4. The cost of inaction (i.e. not requiring disinfection) would likely be seen in health care costs associated with illnesses attributable to pathogens in the wastewater that are discharged to the streams supporting recreation. This cost is difficult to ascertain. Records are not available to indicate the number of people who contract illnesses while recreating in streams receiving effluent that has not been disinfected. Therefore, this report is unable to make a comparison between this potential health care cost and the costs associated with disinfection. However, this report does observe that the costs associated with requiring disinfection to protect streams designated to WBC by this rule is a new cost, whereas, the health care cost that would be attributable to not designating the use, and consequently not requiring disinfection, is a current cost.

If, due to inaction, EPA takes action to promulgate “fishable/swimmable” use designations in Missouri, it is probable that the spatial extent of waters covered by the rule would be greater than what is contained in the proposed rule. An increase in the extent of classification could result in additional regulatory burden for both the department and the regulated community, although the extent and amount is not known at this time.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

Because the proposed revisions are a clarification of the existing rule, no costs are expected to be created by this action. Some savings may be expected in that the revisions may prevent confusion in the rule's interpretation. Inaction may result in insufficient protection of aquatic communities and a lack of flexibility in designating waters to subcategories of a designated use where appropriate.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

Because this proposed revision is only a clarification of the existing rule, no costs are expected to be created by this action. Some savings may be expected in that this revision may prevent confusion in the rule's interpretation.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

The costs and benefits of the proposed rule are explained in Response 4d. With variance authorizing provisions in rule, applicants and the department can seek time-limited relief from WQS while ensuring progress toward meeting water quality goals. Some savings may be realized as the variance issuance process is standardized and streamlined. Inaction in adding variance authorizing provisions in rule will slow the rate of compliance with WQS and increase enforcement activities as facilities go into noncompliance with the terms and conditions of their permits.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

With adequate data, a comparison could be made between the increased or decreased costs in treatment and the revisions in water quality criteria which would result from this amendment. However, data are insufficient to determine the number and the extent to

which treatment systems would be affected, and consequently, to determine the probable change in pollutant concentrations in the receiving waters.

Inaction with regard to implementing CWA Section 304(a) numeric water quality criteria may compel EPA to promulgate these criteria for Missouri at the federal level. The difference in cost and impact of EPA promulgating these criteria instead of the department is not expected to be significant.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

With adequate data, a comparison could be made between the cost savings in treatment and the increase in phenol concentrations which would result from this amendment. However, data are insufficient to determine the number and the extent to which treatment systems would be affected, and consequently, to determine the probable change in phenol concentrations in the receiving waters.

Inaction with regard to revision of numeric water quality criteria for phenol would leave the existing water quality criteria at the current level. Leaving the existing water quality criteria in place would provide greater protection to water quality since the current standards are lower than the proposed standards. However, as described in Response 4f above, inaction would not afford relief to facilities that may have phenol identified as a pollutant of concern in their discharge permit.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

With adequate data, a comparison could be made between the cost savings in treatment and the increase in sulfate and chloride concentrations which would result from this amendment. However, data are insufficient to determine the number and the extent to which treatment systems would be affected, and consequently, to determine the probable change in sulfate and chloride concentrations in the receiving waters.

Inaction with regard to revision of numeric water quality criteria for sulfate and chloride would leave the existing water quality criteria at their current level. Leaving the existing water quality criteria in place would provide greater protection to water quality since the current standards are lower than the proposed standards. However, as described in Response 4g above, inaction would not afford relief to facilities that may have sulfate and/or chloride identified as a pollutant of concern in their discharge permit.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

With adequate data, a comparison could be made between the cost savings in treatment and the increase in BOD which would result from this amendment. However, data are insufficient to determine the number and the extent to which treatment systems would be affected, and consequently, to determine the probable change in DO concentrations in the receiving waters.

The inclusion of additional DO criteria in rule may create an economic benefit for the facilities that currently discharge oxygen-demanding pollutants. The department would avoid having to inappropriately place streams on an impaired waters list based on the existing criteria, and consequently, having to later address the listing through a standards

revision or TMDL. Inaction would preclude any of these benefits to permitted facilities and the department.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

Inaction would result in La Barque Creek not receiving designation as an OSRW. The high level of water quality and aquatic life assemblages in the stream would not be adequately protected and the water body would not qualify for tier three protection under the antidegradation policy. Lack of the OSRW designation may result in incremental loss of high quality water and aquatic life assemblages and negatively impact the recreational, scientific and educational opportunities that the stream provides.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

Inaction would result in MDC and other lakes not receiving fundamental protections of existing and presumed “fishable/swimmable” use as required by the federal CWA. Aquatic life, recreational and other uses would not be adequately protected and the waters would not qualify for protection under the antidegradation policy.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

The costs and benefits of this proposed rule are discussed in Responses 4k and 5k. Costs are generally associated with pollution control activities including disinfection systems for point sources and BMPs for nonpoint sources. The average yearly cost for operating disinfection systems at domestic wastewater treatment systems, which are the most prevalent point source for bacteria pollution, is shown in Tables 4.3 and 4.4. The cost of inaction (i.e. not requiring disinfection) would likely be seen in health care costs associated with illnesses attributable to pathogens in the wastewater that are discharged to the streams supporting recreation. This cost is difficult to ascertain. Records are not available to indicate the number of people who contract illnesses while recreating in streams receiving effluent that is not disinfected. Therefore, this report is unable to make a comparison between this potential health care cost and the costs associated with disinfection. However, this report does observe that the costs associated with requiring disinfection to protect streams designated to WBC by this rule is a new cost, whereas, the health care cost that would be attributable to not designating the use, and consequently not requiring disinfection, is a current cost.

l) Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

The department was notified by EPA on October 29, 2009 that new or revised standards (i.e., standards supporting WBC) are necessary to meet the requirements of the federal CWA for the 28.6-mile segment of the Mississippi River from North Riverfront Park to the confluence with the Meramec River. Inaction on behalf of the department to designate WBC protection to this segment, or provide sufficient information to EPA that demonstrates that the WBC use is not attainable, would compel EPA to prepare and publish regulations for WBC at the federal level in accordance with Section 303(c)(4) of the federal CWA.

Presentation of additional data and information to the department regarding use attainability would not constitute inaction on the rule. Any new data and information that are provided would be reviewed in light of the current draft and used to support any modification to the current draft of the rule.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

Because the proposed revisions only clarify the existing classification system in the current rule, no costs are expected to be created by this action. Some savings may be expected to result and the revision should eliminate confusion in locating the classified segments.

n) Correction of Typographical Errors:

Neither action nor inaction to correct the typographical errors would result in any significant difference in the costs or benefits associated with this rulemaking.

7. Determination of whether there are less costly or less intrusive methods for achieving the proposed rule

Regional organizations, county governments, or municipal governments could enact laws or policies that provide similar or greater protection of water resources within their jurisdiction. This has been done in a few select areas of the state, but it does not provide adequate protection for the entire state population and resources. As a result, statewide action through rulemaking is required for these items.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The centerpiece of the current use designation proposal (i.e., all perennial rivers and streams and intermittent streams with permanent pools and those waters spatially represented by the 1:100,000 scale NHD) arose from the Water Protection Forum and other stakeholder discussions that included agricultural, industry and municipal representatives. The proposal was developed through the stakeholder process to be the least costly and least intrusive means for achieving compliance with the “fishable/swimmable” requirement of the federal CWA and resolve the lawsuit between EPA and the Missouri Coalition for the Environment.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

This revision does not create new requirements or any costs. The purpose of the revision is to improve the clarity of the rule. Therefore, it should not result in any change in the cost of compliance and should lessen any potential for confusion regarding the implementation of the rule.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

This revision does not create new requirements or any costs. The purpose of the revision is to improve the clarity of the rule. Therefore, it should not result in any change in the cost of compliance and should lessen any potential for confusion regarding the implementation of the rule.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

Alternatives to variance authorizing provisions include site-specific criteria and enforcement mechanisms such as administrative orders, settlement agreements, and consent judgments. Site-specific criteria development requires extensive research and modeling, which can be time consuming and expensive for the permittee. Enforcement mechanisms can also require extensive research and be administratively burdensome on both the permittee and the department. Variance authoring provisions are a less costly and less intrusive means of offering time-limited relief to permitted facilities to meet WQS.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

Other methods for achieving the proposed rule, such as a temporary variance from the standards or the use of another method for criteria development, would likely result in more stringent criteria. The federal criteria allow for some refinement of criteria to site-specific conditions through procedures called "species recalculation" and "water effects ratio". However, these procedures are highly site-specific and resource intensive and, as such, would not be considered less costly or less intrusive methods.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

Other methods for achieving the proposed rule, such as a temporary variance from the standards or the use of another method for criteria development, may result in more stringent criteria. The federal criteria allow for some refinement of criteria to site-specific conditions through procedures called "species recalculation" and "water effects ratio". However, these procedures are highly site-specific and resource intensive and, as such, would not be considered less costly or less intrusive methods.

In the case of phenol, existing federal toxicity data and guidance were available and used to revise the numeric water quality criteria found in rule. This option was the least costly and intrusive means for achieving the proposed rule and satisfying the petition before the MCWC.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

Other methods for achieving the proposed rule, such as a temporary variance from the standards or the use of another method for criteria development, may result in more stringent criteria. The federal criteria allow for some refinement of criteria to site-specific conditions through procedures called "species recalculation" and "water effects ratio". However, these procedures are highly site-specific and resource intensive and, as such, would not be considered less costly or less intrusive methods.

In the case of sulfate and chloride, existing state (Iowa) and federal toxicity data and guidance were available and used to revise the numeric water quality criteria found in rule. This option was the least costly and intrusive means for achieving the proposed rule and satisfying the petition before the MCWC.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

Other methods for achieving the proposed rule, such as a temporary variance from the standards or the use of another method for criteria development, may result in more stringent criteria. The federal criteria allow for some refinement of criteria to site-specific conditions through procedures called "species recalculation" and "water effects ratio". However, these procedures are highly site-specific and resource intensive and, as such, would not be considered less costly or less intrusive methods. In addition, none of these alternatives appear to present an acceptable method for supporting criteria revisions for DO. These tests generally measure toxicity or the effects of toxic pollutants and require extensive research under laboratory settings.

In the case of DO, existing federal data and guidance were available and used to revise the numeric water quality criteria found in rule. Unlike a variance, modifying the DO criteria currently in rule offers a more permanent (as opposed to temporary) change. In addition, this option was the least costly and intrusive means for achieving the proposed rule and satisfying the petition before the MCWC.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

This revision does not impose any new costs on existing dischargers nor does it require significant changes in efforts to achieve compliance. Future dischargers to La Barque Creek will need to comply with 10 CSR 20-7.015(6)(B) of Missouri's effluent regulations. Existing water quality protections and tier three antidegradation reviews apply only to outstanding state and national resource waters. Without this rule, La Barque Creek in Jefferson County will not be appropriately protected.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

Numeric chronic criteria and designated beneficial uses apply only to classified waters. Without this rule, these lakes will not be appropriately protected for the existing and presumed uses that may occur. Designation of "fishable/swimmable" use designations to these waters is the least costly and least intrusive means for achieving compliance with the federal CWA.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

A UAA is required in order to rebut the presumption that WBC can be attained in the targeted waters. Missouri currently has only one protocol for performing recreational UAAs, "Missouri Recreational Use Attainability Analyses: Water Body Survey and Assessment Protocol, Missouri Department of Natural Resources, Division of Environmental Quality, Water Protection Program, December 19, 2007." Therefore, the methods chosen are the only methods available to achieve the proposed rule. Less costly and less intrusive means for conducting UAAs may not be structurally or scientifically sufficient to meet the burden of proof necessary to comply with 40 CFR 131.10(g).

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

A UAA is required in order to rebut the presumption that WBC can be attained in the 28.6-mile segment of the Mississippi River under consideration. Less costly and less

intrusive means for determining use attainability may not be structurally or scientifically sufficient to meet the burden of proof necessary to comply with 40 CFR 131.10(g).

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

These revisions do not impose any new costs on dischargers nor does it require significant changes in efforts to achieve compliance. Therefore, no other less costly or intrusive option exists to achieve the objective of this revision.

n) Correction of Typographical Errors:

Correcting the typographical errors in this rulemaking is the only reasonable alternative for addressing the errors. No other less costly or intrusive option exists to achieve the objective of this revision.

8. Description of any alternative method for achieving the purpose of the proposed rule that were seriously considered by the Department and the reasons why they were rejected in favor of the proposed rule

For most of the proposed rules, EPA requires a regulatory program to ensure the effective administration of clean water standards. No other state agency has the authority or funding source to administer such a program. EPA has delegated its authority only to the department for administering a water quality program and that delegation hinges on the program being functionally equivalent to the federal CWA.

Because the EPA guidelines offer the only current rationale for the selection of the proposed standards, the department defers to EPA's rationale for the science used in developing the standards. In order to establish standards other than those contained in EPA's guidelines, the state would need to provide rationale that is equally pervasive. That effort would take years and enormous resources, and would not likely lead to standards any different than that developed by EPA.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

Two alternatives were considered by the stakeholder group and department prior to selecting the proposed extent. The first alternative proposed to apply default "fishable/swimmable" use designations to all waters of the state as defined in rule. Stakeholders from agricultural, industry and municipal groups contended that the "waters of the state" extent was too broad and would extend protections beyond the limit required by Section 101(a) of the federal CWA. From a department perspective, no readily available GIS database exists that would allow for efficient implementation and administration of newly classified waters of the state. Without a GIS database capturing all waters of the state, the spatial extent of the designation was unknown. Also, the lack of structured, tiered aquatic community use designations in rule limits the department's ability to set appropriate use designations and criteria to the large number of headwater and ephemeral streams that would be incorporated into rule. Appropriate use designations are necessary to ensure appropriate protection of those designated uses that exist or are attainable in headwaters and ephemeral streams.

The second alternative proposed to apply default “fishable/swimmable” use designations to the 1:24,000 scale NHD. Designation of default uses to the 1:24,000 scale NHD would add an additional 158,565 miles of stream (183,591 miles total) to the existing classified waters network. Stakeholders from agricultural, industry and municipal groups again contended that the extent of classification would be too broad and extend protections beyond the limit required. Aquatic community data from the department and MDC appeared to substantiate this contention to some degree, where aquatic life was not as abundant on 1:24,000 scale NHD as opposed to 1:100,000 scale NHD waters. From a department perspective, a readily available GIS database exists from which efficient implementation and administration of newly classified waters could occur. Although the 1:24,000 scale NHD database is more complete and more readily available than the 1:100,000 scale NHD layer, the uncertainty to which aquatic communities exist on 1:24,000 scale NHD waters weighed strongly against using the linework as a default designation. Because an aquatic community UAA protocol is proposed to accompany the rulemaking, waters that do contain aquatic life, but reside on the 1:24,000 scale NHD, can easily be added to the classified network as the need arises.

From an economic perspective, all permitted facilities discharge within 2 miles of the 1:100,000 scale NHD dataset and no significant difference in cost exists for any facility between the 1:24,000 or 1:100,000 scale NHD. From an environmental perspective, protections of aquatic communities and recreational uses would be the same since all facilities are currently permitted to the chronic toxicity level and all domestic facilities would be required to disinfect. Additional burden with respect to monitoring and assessment may be incurred by the department at the 1:24,000 scale NHD scale as it constitutes an additional 73,720 miles of stream that would need monitoring. If the current annual percentage of waters monitored is extended to the 1:24,000 scale NHD, annual monitoring costs would increase to \$24.2 million.

Ultimately, the 1:100,000 scale NHD proposal was advanced through the stakeholder group into the proposed rule because of the following: 1) certainty of aquatic communities on the spatial extent of the 1:100,000 scale NHD; 2) an aquatic life UAA protocol would be available to add or remove waters from the rule; and 3) support from the regulated community that the proposal represents an appropriate extent for extending “fishable/swimmable” protections required by Section 101(a) of the federal CWA.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The purpose of the use designation revisions is to improve the clarity of the rule, with the intention to provide greater flexibility in the designation and protection of aquatic community uses. The added flexibility to designate waters as warm, cool, cold, modified and exceptional aquatic community are alternatives not currently found in rule. The addition of an aesthetic use designation will ensure general criteria are linked to an established and implementable designated use. Any other method of making these clarifications would not directly address the problem or provide a permanent solution.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

The purpose of the revision is to improve the clarity of the rule, with an intention to lessen any potential for confusion regarding implementation of the rule. Any other

method of making this clarification would not directly address the problem or provide a permanent solution.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

Alternatives to variances from WQS include development of site-specific criteria for individual pollutants, through species recalculation and water effects ratios, and enforcement mechanisms such as administrative orders, settlement agreements, and consent judgments. These alternatives are highly site-specific and resource intensive, especially considering the need for these alternatives is time-limited. The option chosen provides a solution that directly addresses the problem and provides a permanent solution in rule for both permittees and the department.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

Alternatives to Section 304(a) numeric water quality criteria include development of site-specific criteria for individual pollutants through species recalculation and water effects ratios. The revisions proposed were preferred as the most science-based alternative that would broadly protect aquatic communities.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

Alternatives to the water quality criteria for phenol include development of site-specific criteria through species recalculation and water effects ratios. The revision proposed was preferred as the most science-based alternative that would broadly protect aquatic community and human health protection uses.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

Alternatives to the water quality criteria for sulfate and chloride include development of site-specific criteria through species recalculation and water effects ratios. The revision proposed was preferred as the most science-based alternative that would broadly protect aquatic community uses.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

Alternatives to the water quality criteria for DO include development of site-specific criteria for individual streams. Site-specific DO determinations would be very complex and expensive as they would need to define the effects of various levels of DO exposures to resident aquatic species. The revision proposed was preferred as the most science-based alternative that would broadly protect aquatic community uses.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The alternatives to designation of La Barque Creek as a OSRW include no action and designation of the water as an “exceptional aquatic community” under the new aquatic community use designation framework. The “no action” alternative was not chosen because inaction to implement additional protections may lead to degradation of the stream’s aquatic and recreational resources. The alternative to designate La Barque Creek as an “exceptional aquatic community” was not chosen because the criteria for determining the aquatic assemblages necessary for the use designation have yet to be

established. The preferred option to designate La Barque Creek as an OSRW was chosen because the water body meets the criteria found in rule at 10 CSR 20-7.031(8) and the alternatives noted above would not provide the water quality and antidegradation protection required.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The only alternative to adding MDC and other identified lakes to Table G of the WQS is to take “no action”. However, inaction is not a viable or allowable option given Section 101(a) of the federal CWA requires existing “fishable/swimmable” uses be protected in rule. For this reason, the MDC lakes, and other identified lakes, have been proposed for addition to Table G. There are no alternatives that would qualify these lakes for the protections they need.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

A UAA is required in order to rebut the presumption that WBC can be attained in the targeted waters and Missouri currently has only one protocol for performing recreational UAAs. Therefore, the methods chosen are the only methods available to achieve the proposed rule.

l) Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

A UAA is required in order to rebut the presumption that WBC can be attained in this segment of the Mississippi River. The methods chosen to assess attainment were conducted using factors found in federal regulation at 40 CFR 131.10(g) and the only methods available to achieve the proposed rule.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The department had previously extrapolated the location and extent of water bodies from paper maps and reported their boundaries in terms of legal descriptions. This method of water body delineation and measurement is not very accurate and may lead to either an under-application or over-application of the beneficial uses and criteria to classified waters. The proposed revisions will eliminate these potential problems with the tables by using more accurate GIS and field data to achieve the proposed rule.

n) Correction of Typographical Errors:

Correcting the typographical errors in this rulemaking is the only reasonable alternative for addressing the errors.

9. Analysis of both short-term and long-term consequences of the proposed rule

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The short term consequence of the proposed rule is a change in permit terms and conditions for domestic WWTFs that discharge to, or within 2 miles of, 1:100,000 scale NHD streams. The new permit conditions will establish a regulatory requirement for achieving bacteria standards in the receiving stream. Some of these permits will contain schedules of compliance of up to eight years to design, build and operate a disinfection

system. The long-term consequence is the annual O&M cost associated with wastewater treatment and the improved protection of public health during recreational use of the streams affected by this rule. From a department perspective, the short-term and the long-term consequences of this rule are to protect the uses in these streams through regular monitoring and assessment of their water quality.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The proposed rule amendment revises and adds use designation definitions to allow for accurate and appropriate use designations and protection. The short-term and long-term consequences of the proposed rule amendment are the same and will afford appropriate protection of aquatic community and aesthetic uses without incurring unnecessary costs to the regulated community.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

The proposed rule revision is a clarification of the early life stages definition and does not create any new requirements or costs. In the short-term and long-term, the rule revision should not result in any change in the cost of compliance. However, the proposed revision should lessen any potential for confusion regarding implementation of the early life stages provision of the rule.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

The proposed addition of variance authorizing provisions does not create any new requirements or costs. In the short-term and long-term, the rule revision will afford the regulated community and department flexibility in meeting long-term water quality goals while making short-term improvements. The rule revision may reduce the cost of compliance for permitted facilities in the short-term as permit requirements to meet WQS may be implemented over longer periods of time. Because variances are time-limited, compliance with applicable WQS will be guaranteed by schedules of compliance or other means that ensure short-term and long-term milestones are met.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

The short-term and long-term consequences of this rule amendment are the same: the protection of aquatic communities without imposing unnecessary costs to the regulated community. Where revised Section 304(a) criteria are more stringent than currently found in rule, short-term consequences may be incurred by WWTFs. New permit conditions for these WWTFs will establish a regulatory requirement for achieving aquatic community protection standards in the receiving stream. Some of these permits will contain schedules of compliance of up to three years to design, build and operate treatment process upgrades. Depending on the level of treatment presently employed at each facility, the level of additional treatment needed may vary on a case-by-case basis. The long-term consequence is the annual O&M cost associated with wastewater treatment. Where revised Section 304(a) criteria are less stringent than currently found in rule, short-term and long-term consequences may include reduction of effluent limitation or monitoring frequency requirements found in the operating permit for the facility.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

The short-term and long-term consequences of this rule amendment are the same: the protection of aquatic communities without imposing unnecessary costs to the regulated community. The revised acute and chronic toxicity criteria are less stringent than currently found in rule. For permitted facilities that may have phenol as a pollutant of concern, short-term and long-term consequences may include reduction of effluent limitation or monitoring frequency requirements found in the facility operating permit. Reductions in economic costs are also likely given the criteria are less stringent than currently found in rule and treatment costs required to comply with the new standards would be less.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

The short-term and long-term consequences of this rule amendment are the same: the protection of aquatic communities without imposing unnecessary costs to the regulated community. The revised acute and chronic toxicity criteria are less stringent than currently found in rule. For permitted facilities that may have sulfate and/or chloride as a pollutant of concern, short-term and long-term consequences may include reduction of effluent limitation or monitoring frequency requirements found in the facility operating permit. Reductions in economic costs are also likely given the criteria are less stringent than currently found in rule and treatment costs required to comply with the new standards would be less.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

The short-term and long-term consequences of this rule amendment are the same: the protection of aquatic communities without imposing unnecessary costs to the regulated community. The revised criteria provide a wider range of DO conditions from which to assess compliance and attainment of aquatic community protection uses. The current one-size fits all DO minimum criterion does not work in many parts of the state where DO criteria are not routinely met, but aquatic assemblages can be considered abundant and diverse. Because the new DO criteria more closely reflect the DO levels expected to exist within natural settings, no short-term or long-term effect to aquatic life is expected. Short-term and long-term reductions in economic cost are likely given a wider range of criteria can be used for assessment and wasteload allocation derivation. WWTF discharge permits may receive less restrictive effluent limits for BOD as a result of this rule amendment. An important long-term positive consequence is that DO criteria will exist in rule upon which to develop and implement accurate discharge permits, TMDLs, and water body assessments.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The short-term and long-term consequences of this rule amendment are the same: the protection of the unique and diverse aquatic communities and recreational opportunities found in the stream. The addition of La Barque Creek as an OSRW will provide for the protection of water quality according to the antidegradation policy. Any new discharges into the designated section of the stream or any tributaries that flow into that section of the stream will be required to first investigate if non-discharging options would be practical. This requirement would occur regardless of the OSRW designation. If found that non-discharging options would not be practical or feasible, special effluent

limitations would need to be developed such that water quality is not allowed to degrade. Currently, only 4 permitted facilities are located within the La Barque Creek watershed. Future WWTFs, industrial discharges, general permits or stormwater permits will only be permitted if level of existing water quality is maintained. Agricultural activities, except those regulated as CAFOs, and on-site wastewater treatment systems (septic systems) will not be affected since they do not fall under the department's regulatory authority.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The short-term and long-term consequences of this rule amendment are the same: the protection of the aquatic communities and recreational opportunities found in these lakes. WWTFs, industrial discharges, general permits and stormwater permits that are located within the watersheds of these lakes must be permitted under the department's regulation and antidegradation policy. Agricultural activities, except those regulated as CAFOs and on-site wastewater treatment systems (septic systems) will not be affected since they do not fall under the department's regulatory authority.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

The short-term consequence of the proposed rule is a change in permit terms and conditions for bacteria in permits discharging to the targeted streams. The new permit conditions will establish a regulatory requirement for achieving the new bacteria standards. Some of these permits will contain schedules of compliance of up to four years and 364 days to design, build and operate a disinfection system. The long-term consequence is the annual O&M cost associated with wastewater treatment and the improved protection of public health during recreational use of the streams affected by this rule.

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

The short-term consequence of the rule as currently drafted is a change in permit terms and conditions for bacteria in permits discharging to this segment of the Mississippi River. The new permit conditions will establish a regulatory requirement for achieving *E. coli* bacteria criteria protective of the WBC use (i.e., 206 colonies/100 mL of water). Permitted facilities that will be affected include the MSD-Bissell Point WWTF (MO-0025178) and MSD-Lemay WWTF (MO-0025151). Operating permits for these facilities will contain schedules of compliance of up to four years and 364 days to design, build and operate a disinfection system to meet the new requirements. The long-term consequence for these permitted facilities is the annual O&M cost associated with wastewater treatment disinfection processes. An additional long-term consequence for MSD as a whole is the added cost for design, construction and operation of collection system improvements that reduce or eliminate combined sewer overflows (CSOs) discharging to this segment of the Mississippi River. A long-term corollary of disinfection requirements and CSO control are the decrease of bacteria in this segment. However, the environmental benefit of the increased cost is expected to be marginal, given the recreational use of this segment is believed to be incidental to nonexistent.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The proposed rule amendments will improve the identification of classified water segments, making it easier to track the various types of information relative to each water body, such as the standards that apply, the status of water quality, the discharges affecting the water body, etc. These identifications are essential to decisions relating to effluent limitations, compliance determinations and water quality restoration activities.

n) Correction of Typographical Errors:

The correction of these typographical errors will avoid any confusion or delay in decisions based on the sections of the rule affected by the errors.

10. Explanation of the risks to human health, public welfare or the environment addressed by the proposed rule

Section 4 of this report explains some of the risks that may exist should water quality not be protected by the new standards proposed by this rulemaking. Because the department is adopting federal standards for CWA Section 101(a) use designations and water quality criteria, further information on risk assessment may be obtained by reviewing the administrative record created during EPA's development of their technical guidelines.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The designation of aquatic community and human health protection uses to perennial rivers and streams, intermittent streams with permanent pools and streams spatially represented by the 1:100,000 scale NHD recognizes the existing or potential use of these surface waters by aquatic life and humans. The application of numeric criteria (i.e., acute and chronic toxicity criteria), general criteria and antidegradation requirements to these waters protects the aquatic environment and the species that reside there. Protection of the aquatic environment and support for aquatic protection uses enhances the environment and public welfare by providing opportunities for recreation, education, scientific research and protection and propagation of native and recreationally important fish species. A corollary of protection of the aquatic environment and recreationally important fish species is protection of human health for humans that consume fish, other aquatic life and water from these streams. The lack of aquatic community protection through appropriate use designation may irreparably damage or harm these resources to the potential detriment of human health and the environment.

The designation of recreational uses to surface waters recognizes the existing or potential contact people have with these waters. The application of pathogen criteria to these waters protects human health from the risk of gastrointestinal illness in waters designated for recreation. The presence of *E. coli* bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of humans or other animals. This form of contamination may introduce pathogens or disease-producing bacteria or viruses. Some waterborne pathogenic diseases include typhoid fever, viral and bacterial gastroenteritis and hepatitis A. The presence of fecal contamination is an indicator that a potential health risk exists for individuals exposed to this water. FC bacteria may occur in ambient water as a result of the overflow of domestic sewage or nonpoint sources of human and animal waste. The protection of WBC in these waters will significantly reduce any human health concerns due to pathogenic infection.

- b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:**
The purpose of the revision is to improve the clarity of the rule with regard to use designations. Its intent is to lessen any potential for confusion regarding the implementation of the rule. It does not address any risks to public health, welfare or the environment.
- c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:**
The purpose of the revision is to improve the clarity of the rule with regard to early life stages. Its intent is to lessen any potential for confusion regarding the implementation of the rule. It does not address any risks to public health, welfare or the environment.
- d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:**
The purpose of the revision is to improve and streamline the issuance of variances to WQS. Its intent is to afford the regulated community and department flexibility in meeting long-term water quality goals. It does not address any risks to public health, welfare or the environment.
- e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:**
The proposed revisions to Section 304(a) water quality criteria address the toxic effects of these pollutants to aquatic life and the toxic and carcinogenic effects of these pollutants to human health. This amendment proposes to revise the state criteria to reflect the latest federal criteria as described in “*National Recommended Water Quality Criteria*” published in 2009 by EPA, Office of Water and “*2011 Edition of the Drinking Water Standards and Health Advisories*” published in 2011 by EPA, Office of Water. Further information on risk assessment may be obtained by reviewing the administrative record created during EPA’s development of these documents.
- f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:**
The proposed revisions to water quality criteria for phenol address the toxic effects of phenol to aquatic life and the carcinogenic effects of phenol to human health. This amendment proposes to revise the state criteria to reflect the latest federal criteria as described in “*National Recommended Water Quality Criteria*” published in 2009 by EPA, Office of Water and “*2011 Edition of the Drinking Water Standards and Health Advisories*” published in 2011 by EPA, Office of Water. The federal water quality guidance “*Quality Criteria for Water 1986*” published in 1986 by EPA, Office of Water and “*Revised National Recommended Water Quality Criteria for the Protection of Human Health: Final Criteria for Acrolein and Phenol*” published in 2009 by EPA, Office of Water were also used to develop the proposed revisions. Further information on risk assessment may be obtained by reviewing the administrative record created during EPA’s development of these documents.
- g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:**
The proposed revisions to water quality criteria for sulfate and chloride address the toxic effects of these pollutants to aquatic life. This amendment proposes to revise the state criteria to reflect the latest state developed criteria as described in “*WQS Review: Chloride, Sulfate and Total Dissolved Solids*” published in 2009 by the Iowa DNR. Further information on risk assessment may be obtained by reviewing the administrative record created during Iowa’s development of this document.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

The proposed revisions to water quality criteria for DO address the effects of DO concentrations to aquatic life. This amendment proposes to revise the state criteria to reflect the latest federal criteria as described in “*Ambient Water Quality Criteria for DO*” published in 1986 by EPA, Office of Water. Further information on risk assessment may be obtained by reviewing the administrative record created during EPA’s development of this document.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The proposed revision to designate La Barque Creek, Jefferson County as an OSRW enhances protection of the aquatic resources and recreational, scientific and educational opportunities that the stream provides. This enhanced protection addresses the effects of pollutants to aquatic life, human health and the environment.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The proposed revision to add MDC and other lakes to Table G enhances protection of the aquatic resources and recreational opportunities these waters provide. This enhanced protection addresses the effects of pollutants to aquatic life, human health and the environment, including:

- Aquatic life is impacted by nutrient loading at several levels. It can increase the probability of fish kills due to oxygen depletion that results from excessive algae growth. It can also undermine aquatic diversity by creating conditions favorable to certain fast growing species, such as carp and benthivores, at the expense of other species (Edgerton and Downing, 2004).
- Drinking water problems are frequently attributed to specific species of algae that produce a range of toxicities. The consequences can include taste and odor problems and risks to human health as well as to livestock and wildlife. (Downing et al. 2001).
- WBC can be impaired because of reduced water clarity associated with algae growth. This can affect the attractiveness of a water body, as well as safety concerns due to reduced water clarity.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

The designation of recreational uses to surface waters recognizes the existing or potential contact people have with these waters. The application of pathogen criteria to these waters protects human health from the risk of gastrointestinal illness in water bodies designated for recreation. The presence of *E. coli* bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. This form of contamination may introduce pathogens or disease producing bacteria or viruses. Some waterborne pathogenic diseases include typhoid fever, viral and bacterial gastroenteritis and hepatitis A. The presence of fecal

contamination is an indicator that a potential health risk exists for individuals exposed to this water. FC bacteria may occur in ambient water as a result of the overflow of domestic sewage or nonpoint sources of human and animal waste.

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

The designation of recreational uses to surface waters recognizes the existing or potential contact people have with these waters. The application of pathogen criteria to these waters protects human health from the risk of gastrointestinal illness in water bodies designated for recreation. The presence of *E. coli* bacteria in aquatic environments indicates that the water has been contaminated with the fecal material of man or other animals. This form of contamination may introduce pathogens or disease producing bacteria or viruses. Some waterborne pathogenic diseases include typhoid fever, viral and bacterial gastroenteritis and hepatitis A. The presence of fecal contamination is an indicator that a potential health risk exists for individuals exposed to this water. Fecal coliform bacteria may occur in ambient water as a result of the overflow of domestic sewage or nonpoint sources of human and animal waste.

However, other risks of whole body contact recreation unique to this segment (i.e., large amounts of barge traffic and strong currents) appear to far exceed any risk due to bacteria. Consequently, the department does not condone or recommend use of this segment for WBC.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The purpose of the revisions is to improve the clarity of the rule. This change did not significantly affect any risks to public health, welfare or the environment.

n) Correction of Typographical Errors:

These typographical errors do not pose any human health or environmental risks.

11. Identification of the sources of scientific information used in evaluating the risk and a summary of such information

Section 2 and Appendix A of this report presents the information used in developing this proposed rule. Because the department is adopting federal standards for CWA Section 101(a) use designations and water quality criteria, further information on risk assessment may be obtained by reviewing the administrative record created during EPA's development of their technical guidelines. In these cases, the department defers to the science used in the national studies for evaluating the risks to aquatic life and human health.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The designation of aquatic community, human health and recreational protections as required by CWA Section 101(a) recognizes the existing or potential use of these surface waters by aquatic life and humans. Subsequent sections of the CWA provide the tools necessary to perform the risk assessments and testing necessary to ensure the goals of the CWA are met. As detailed in CWA Section 304(a)(1)(A), the CWA provides for development of water quality criteria that accurately reflects the latest scientific

knowledge “on the kind and extent of all identifiable effects on health and welfare including, but not limited to, plankton, fish, shellfish, wildlife, plant life, shore lines, beaches, esthetics, and recreation which may be expected from the presence of pollutants in any body of water”. In protecting waters for “fishable/swimmable” uses and developing criteria to protect those uses, the CWA promotes and provides the regulatory framework for identifying and minimizing risks to human health, public welfare and the environment.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The purpose of the revision is to improve the clarity of the rule with regard to use designations. Its intent is to lessen any potential for confusion regarding the implementation of the rule. It does not affect any risks to public health, welfare or the environment.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

The purpose of the revision is to improve the clarity of the rule with regard to early life stages. Its intent is to lessen any potential for confusion regarding the implementation of the rule. It does not affect any risks to public health, welfare or the environment.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

The purpose of the revision is to improve and streamline the issuance of variances to WQS. Its intent is to afford the regulated community and department flexibility in meeting long-term water quality goals. It does not affect any risks to public health, welfare or the environment.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

This amendment proposes to revise the state criteria to reflect the latest federal criteria as described in “*National Recommended Water Quality Criteria*” published in 2009 by EPA, Office of Water and “*2011 Edition of the Drinking Water Standards and Health Advisories*” published in 2011 by EPA, Office of Water. Scientific information used in evaluating risks to aquatic life and human health can be found in these documents.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

This amendment proposes to revise the state criteria to reflect the latest federal criteria as described in “*National Recommended Water Quality Criteria*” published in 2009 by EPA, Office of Water and “*2011 Edition of the Drinking Water Standards and Health Advisories*” published in 2011 by EPA, Office of Water. The federal water quality guidance “*Quality Criteria for Water 1986*” published in 1986 by EPA, Office of Water and “*Revised National Recommended Water Quality Criteria for the Protection of Human Health: Final Criteria for Acrolein and Phenol*” published in 2009 by EPA, Office of Water were also used to develop the proposed revisions. Scientific information used in evaluating risks to aquatic life and human health can be found in these documents.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

This amendment proposes to revise the state criteria to reflect the latest state developed criteria as described in “*WQS Review: Chloride, Sulfate and Total Dissolved Solids*” published in 2009 by the Iowa Department of Natural Resources. These criteria were developed in cooperation with EPA and reviewed and approved by the agency in Iowa’s state WQS. Scientific information used in evaluating risk to aquatic life can be found in this document.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

This amendment proposes to revise the state criteria to reflect the latest federal criteria as described in “*Ambient Water Quality Criteria for DO*” published in 1986 by EPA, Office of Water. Scientific information used in evaluating risk to aquatic life can be found in this document.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The proposed revision to designate La Barque Creek, Jefferson County as an OSRW enhances protection of the aquatic resources and recreational, scientific and educational opportunities that the stream provides. This enhanced protection will decrease risks to public health, welfare or the environment.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The proposed revision to add MDC and other lakes to Table G enhances protection of the aquatic resources and recreational opportunities these waters provide. This enhanced protection will decrease risks to public health, welfare or the environment as detailed in the discussion and scientific information referenced in Response 10j.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

A number of studies have shown that public health is protected when the pathogen levels in recreational waters are controlled. Appropriate designation of WBC and SCR through the UAA process ensures public health is protected and risk of pathogen exposure is reduced where recreational uses are existing or attainable.

l) Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

A number of studies have shown that public health is protected when the pathogen levels in recreational waters are controlled. Appropriate designation application of WBC bacteria criteria through the UAA process ensures public health is protected and risk of pathogen exposure is reduced where recreational uses are attainable.

In regard to other risks of recreating in this segment, the department is anticipating additional data and information from MSD, to supplement the information already in the administrative record, that would provide details regarding barge traffic and fleeting volumes in the segment and how place, time or manner restrictions on commercial barge and boat traffic (with complimentary restrictions on recreational use) may impact local and regional socio-economics.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The purpose of the revisions is to improve the clarity of the rule. This change did not significantly affect any risks to public health, welfare or the environment.

n) Correction of Typographical Errors:

These corrections are not proposed on the basis of science or reducing risk. Therefore, this section is not relevant to this revision.

12. Description and impact statement of any uncertainties and assumptions made in conducting the analysis on the resulting risk estimate

Because the department is adopting federal standards for portions of this rulemaking, further information on risk assessment may be obtained by reviewing the administrative record created during EPA's development of their technical guidelines. Providing information on uncertainties and assumptions would require an analysis of the preamble to the federal rule and it is uncertain that EPA documented all of the uncertainties and assumptions involved in their rule development. For federal criteria promulgation at the state level, the reader is referred to the federal guidance for statements on the uncertainties and assumptions made in conducting the analysis on the resulting risks.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

In protecting waters for "fishable/swimmable" uses and developing criteria to protect those uses, the CWA promotes and provides the regulatory framework for identifying and minimizing risks to human health, public welfare and the environment. The designation of aquatic community, human health and recreational protections as required by CWA Section 101(a) recognizes the existing or potential use of these surface waters by aquatic life and humans. Under the CWA, "fishable/swimmable" uses must be extended to all waters of the United States, the extent of which has been the subject of controversy and litigation for over a decade. Supreme Court cases such as *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers (SWANCC)* and *Rapanos v. United States (Rapanos)* have led to EPA and the U.S. Army Corps of Engineers developing guidance for CWA practitioners on interpreting the extent of waters of the United States. The document, *"Draft Guidance on Identifying Waters Protected by the CWA"* is currently out for public comment until July 1, 2011.

The EPA and U.S. Army Corps of Engineers guidance does not establish a linkage between waters of the United States and any one specific spatial extent or map scale. Rather, the guidance endeavors to be consistent with the established Supreme Court cases and supported by the agencies' scientific understanding of how water bodies and watersheds function. From the standpoint of the proposed rule's application of CWA Section 101(a) use designations to the 1:100,000 scale NHD, there is some uncertainty and an assumption that aquatic community and recreational uses are attainable at this spatial scale. Biological data and information collected by the department and MDC suggest that aquatic communities exist on streams spatially represented by the 1:100,000 scale NHD extent and that attainability and existing use at this scale is more certain than at other scales (e.g., 1:24,000 scale NHD). However, stream morphology suggests that recreational use for WBC is not as abundant on streams spatially represented by the

1:100,000 scale NHD extent, which may represent the upper end of attainability for that use. While there is uncertainty in the extent to which aquatic community and recreational uses extend into headwater streams, the assumption that the 1:100,000 scale NHD captures what constitutes waters of the United States under current guidance is likely sound. Waters with existing or attainable aquatic community or recreational uses that do not fall within the proposed spatial extent of the 1:100,000 scale NHD will receive those designations as existing uses. Streams and rivers that are perennially flowing or intermittently flowing with permanent pools will also receive “fishable/swimmable” use designations under the proposed rule.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The purpose of the revision is to improve the clarity of the rule with regard to use designations. It does not affect any risks to public health, welfare or the environment. Therefore, no uncertainties exist with respect to the revision.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

The purpose of the revision is to improve the clarity of the rule with regard to early life stages. It does not affect any risks to public health, welfare or the environment. Therefore, no uncertainties exist with respect to the revision.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

The purpose of the revision is to improve and streamline the issuance of variances to WQS. It does not affect any risks to public health, welfare or the environment. Therefore, no uncertainties exist with respect to the revision.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

This amendment proposes to revise state criteria to reflect the latest federal CWA Section 304(a) criteria. Because the department is adopting federal standards for these revisions, further information on uncertainties and assumptions made during the risk assessment may be obtained by reviewing the administrative record created during EPA’s development of technical guidelines and guidance for these pollutants.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

This amendment proposes to revise the state criteria for phenol to reflect the latest federal criteria. Because the department is adopting federal standards for these revisions, further information on uncertainties and assumptions made during the risk assessment may be obtained by reviewing the administrative record created during EPA’s development of technical guidelines and guidance for this pollutant.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

This amendment proposes to revise the state criteria for sulfate and chloride to reflect the latest state developed, federally approved criteria. Because the department is adopting state and federally approved standards for these revisions, further information on uncertainties and assumptions made during the risk assessment may be obtained by reviewing the administrative record created during the Iowa DNR’s development of technical guidelines and guidance for these pollutants.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

This amendment proposes to revise the state criteria for DO to reflect the latest federal criteria. Because the department is adopting federal standards for these revisions, further information on uncertainties and assumptions made during the risk assessment may be obtained by reviewing the administrative record created during EPA's development of technical guidelines and guidance for this pollutant.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The enhanced protection of La Barque Creek as an OSRW will decrease risks to public health, welfare and the environment through permitting and antidegradation requirements. No significant uncertainties or assumptions exist with respect to this revision.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The enhanced protection of MDC and other lakes added to Table G will decrease risks to public health, welfare and the environment through permitting and antidegradation requirements. No significant uncertainties or assumptions exist with respect to these revisions.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

Uncertainties concerning the UAA process and procedures are minimal. Intensive stream morphology measurements, interviews, and a robust public participation process ensure adequate data are collected to determine existing and/or attainable recreational uses. Any assumptions that must be made are conservative and are intended to minimize any risk to human health.

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

Uncertainties concerning the UAA process and procedures are minimal. Intensive stream morphology measurements, interviews, and a robust public participation process ensure adequate data are collected to determine existing and/or attainable recreational uses. Any assumptions that must be made are conservative and are intended to minimize any risk to human health.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The purpose of the revisions is to improve the clarity of the rule. This change did not significantly affect any risks to public health, welfare or the environment. No uncertainties or assumptions exist with respect to these revisions.

n) Correction of Typographical Errors:

No uncertainties exist with respect to correcting the typographical errors.

13. Description of any significant countervailing risks that may be caused by the proposed rule

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

The proposed designation of CWA Section 101(a) “fishable/swimmable” uses to currently unclassified waters will require a significant number of existing domestic wastewater treatment facilities to disinfect their effluent. Disinfection through chlorination can produce other harmful byproducts, such as trihalomethanes. Trihalomethanes are harmful to human health if consumed through drinking water supplies. Because discharges of treated effluent is prohibited above public drinking water supply intakes, this risk will only be posed where discharges are to losing streams that have a hydrologic connection to private wells and where sufficient treatment of the drinking water source is not provided. The department is unable to determine the number of instances where this risk may exist but will assess for this risk at the time a discharge permit is requested and may require alternative means to disinfection, such as UV light, to eliminate the potential for introducing trihalomethanes into groundwater or drinking waters supplies. Chlorine is also an explosive and dangerous chemical and requires safe handling and storage practices at the facility.

Disinfection of effluent through chlorination may also result in residual chlorine that is harmful and toxic to aquatic life. Dechlorination of the effluent may be required to reduce the amount of total residual chlorine to levels protective of aquatic communities.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

There are no significant countervailing risks associated with making the clarification proposed by this revision.

c) Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

There are no significant countervailing risks associated with making the clarification proposed by this revision.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

There are no significant countervailing risks associated with making the addition proposed by this revision.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

The application of new or revised CWA Section 304(a) criteria may result in an increase or decrease in pollutant concentrations within waters of the state depending on the criteria. Existing aquatic communities are not expected to be affected by the change where new or revised criteria may be less stringent than currently found in rule. Full attainment of aquatic communities is expected as the new or revised criteria were developed to be protective of the use. No significant countervailing risks are expected for the proposed revisions.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

The application of revised criteria for phenol may result in an increase in pollutant concentrations within waters that currently have permitted discharges for phenol. Existing aquatic communities are not expected to be affected by the change. Full attainment of aquatic communities is expected as the new or revised criteria were

developed to be protective of the use. No significant countervailing risks are expected for the proposed revision.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

The application of revised criteria for sulfate and chloride may result in an increase in pollutant concentrations within waters that currently have permitted discharges for sulfate and chloride. Existing aquatic communities are not expected to be affected by the change. Full attainment of aquatic communities is expected as the revised criteria were developed to be protective of the use. No significant countervailing risks are expected for the proposed revisions.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

The application of revised criteria for DO may result in an increase in pollutant concentrations within waters that currently have permitted discharges for BOD. The amount of pollutant concentration increase would depend on the aquatic community use designation and the presence or absence of early life stages. Full attainment of aquatic communities is expected as the revised criteria were developed to be protective of the use and any new effluent limitations would be protective of critical conditions. No significant countervailing risks are expected for the proposed revisions.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

There are no significant countervailing risks expected from the designation of La Barque Creek, Jefferson County as an OSRW.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The addition of MDC and other lakes to Table G is expected to produce countervailing risks similar to those found in Response 13a. No additional significant countervailing risks are expected.

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

There are no significant countervailing risks associated with the proposed rule specific to this section. Environmental effects might come from the recommended use designations through the discharge of disinfection by-products when chlorination is used as the disinfection process. Some residual chlorine may enter the receiving water from the disinfection process unless dechlorination processes are required. Dechlorination may also introduce other contaminants, such as trihalomethanes, which may be carcinogenic. Where recreation does occur, the risks to human health from the by-products are less severe than the risk of infection from non-treated effluent. Where recreation does not occur, the addition of the by-products would be the greater risk to the environment.

l) Responding to EPA's October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

There are no significant countervailing risks associated with the proposed rule specific to this section. Environmental effects might come from the recommended use designations through the discharge of disinfection by-products when chlorination is used as the

disinfection process. Some residual chlorine may enter the receiving water from the disinfection process unless dechlorination processes are required. Dechlorination may also introduce other contaminants, such as trihalomethanes, which may be carcinogenic. Where recreation does occur, the risks to human health from the by-products are less severe than the risk of infection from non-treated effluent. Where recreation does not occur, the addition of the by-products would be the greater risk to the environment.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

There are no significant countervailing risks associated with the proposed rule specific to this section.

n) Correction of Typographical Errors:

No countervailing risks have been identified in association with correcting the typographical errors.

14. Identification of at least one, if any, alternative regulatory approaches that will produce comparable human health, public welfare or environmental outcomes

In most cases, the purpose of the revision or addition is to make Missouri's WQS functionally equivalent to federal standards. Because federal technical guidance was available in most cases, and development of state specific alternatives can be resource intensive, no other approaches or alternatives were considered. However, persons who believe another approach is available, and can be supported by sufficient rationale, are encouraged to submit an explanation of the alternative approach to the department during the public comment period on the proposed rule.

a) CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

State WQS must be functionally equivalent to federal standards. In the case of CWA Section 101(a) use designations, "fishable/swimmable" uses must apply to all waters of the United States. Alternative regulatory approaches to the current proposal to designate "fishable/swimmable" uses to the 1:100,000 scale NHD were considered during stakeholder and department discussions. Alternative spatial extents to apply these use designations include the 1:24,000 scale NHD as well as all waters of the state. Designation of "fishable/swimmable" uses to either of these spatial extents would produce comparable human health, public welfare and environmental outcomes. However, the attainability of "fishable/swimmable" uses using these alternative approaches is unknown and their application and implementation could potentially be resource intensive for the department (see Response 8a). For these reasons, the current proposal to designate "fishable/swimmable" uses to the 1:100,000 scale NHD was chosen.

b) CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

The department has not identified any alternative regulatory approaches that would produce comparable results to the clarification proposed by this revision. Inaction would lead to greater confusion and potential misapplication of the rule.

c) Clarification of "Early Life Stages" definition [10 CSR 20-7.031(1)(H)]:

The department has not identified any alternative regulatory approaches that would produce comparable results to the clarification proposed by this revision. Inaction would lead to greater confusion and potential misapplication of the rule.

d) Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

The department has not identified any alternative regulatory approaches that would produce comparable results to the addition proposed by this revision. Inaction would maintain the status quo regarding variance issuance and approval, rather than increase and streamline the process.

e) New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

State WQS must be functionally equivalent to federal standards. The department has not identified any alternative regulatory approaches that would produce comparable results to the changes proposed by these revisions. Therefore, no other approaches or alternatives to CWA Section 304(a) numeric water quality criteria were considered.

f) Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

State WQS must be functionally equivalent to federal standards. The department has not identified any alternative regulatory approaches that would produce comparable results to the changes proposed by this revision. Therefore, no other approaches or alternatives to phenol numeric water quality criteria as found in federal technical guidance were considered.

g) Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

State WQS must be functionally equivalent to federal standards. However, alternative regulatory approaches sanctioned by EPA can be considered. Therefore, the department considered other state developed, and federally approved, sulfate and chloride criteria. The use of EPA approved sulfate and chloride criteria as found in the State of Iowa's WQS constitutes an alternative or approach functionally equivalent to federal standards. The only other alternative that would produce comparable human health, public welfare or environmental outcomes is the current rule, which is more stringent than the proposed one.

h) Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

State WQS must be functionally equivalent to federal standards. The department has not identified any alternative regulatory approaches that would produce comparable results to the changes proposed by this revision. Therefore, no other approaches or alternatives to DO numeric water quality criteria as found in federal technical guidance were considered.

i) Designation of La Barque Creek, Jefferson County as an OSRW [10 CSR 20-7.031, Table E]:

The department has not identified any alternative regulatory approaches that would produce comparable results to the designation of OSRW proposed by this revision. The only alternative regulatory approach available would be designation as an "Exceptional Aquatic Community" water, as defined at 10 CSR 20-7.031(1)(G)1.E. However, because

La Barque Creek in Jefferson County meets the criteria for the OSRW designation as found in rule at 10 CSR 20-7.031(9), the department did not consider the alternative regulatory approach.

j) Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

The department has not identified any alternative regulatory approaches that would produce comparable results to the application of “fishable/swimmable” uses proposed by this revision. Because existing “fishable/swimmable” uses have been identified for these waters, the only alternative regulatory approach available, UAAs, does not apply per 40 CFR 131.10(g).

k) Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

Changes to WBC (i.e., “swimmable”) use designations must be accompanied by a UAA per 40 CFR 131.10(g). The department has not identified any alternative regulatory approaches that would produce comparable results to the proposed changes in designations.

l) Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

Changes to WBC (i.e., “swimmable”) use designations must be accompanied by a UAA per 40 CFR 131.10(g). Designating this segment of the Mississippi River for WBC, instead of the proposed recommendation to designate the segment for SCR and apply the WBC-Category B bacteria criteria, is an alternative regulatory approach and would produce a comparable result to the proposed changes. Rationale for the current proposal can be found in “Recommendation Regarding Whole Body Contact Recreation Use Designation for the Mississippi River (Water Body ID: 1707), North Riverfront Park to Confluence with Meramec River, Missouri Department of Natural Resources, Division of Environmental Quality, Water Protection Program, March 10, 2011”.

m) Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

The department has not identified any alternative regulatory approaches that would produce comparable results to the proposed revisions.

n) Correction of Typographical Errors:

Correcting the typographical errors in this rulemaking is the only reasonable alternative for addressing the errors.

15. Information on how to provide comments on the RIR during the 60-day period before the proposed rule is filed with the SOS

RIRs for current rule developments of the Water Pollution Control Branch may be found on the Water Protection Program Rule Development web page:

<http://www.dnr.mo.gov/env/wpp/rules/wpp-rule-dev.htm>.

The comment period for this RIR is planned for June 3, 2011 through August 2, 2011. Comments can be submitted by e-mail to John Hoke, john.hoke@dnr.mo.gov. Comments may also be sent by mail to:

John Hoke
Missouri Department of Natural Resources
Water Protection Program
P.O. Box 176
Jefferson City, Missouri 65102-0176

After publication in the *Missouri Register*, there will be another opportunity for public input during the open comment period and public hearing related to the proposed rulemaking prior to rule adoption.

16. Information on how to request a copy of comments or the web information where the comments will be located

Comments received may be viewed on the Water Protection Program Rule Development web page at <http://www.dnr.mo.gov/env/wpp/rules/wpp-rule-dev.htm>. Copies of these comments may also be requested directly from the program by e-mail from John Hoke, john.hoke@dnr.mo.gov or by telephone: (573) 751-6623.

Appendix A – Technical Documents and Data Used in Developing Proposed Rule

General Rulemaking Documents

1. Missouri Revised Statutes, Chapter 536 – Administrative Procedure and Review.
<http://www.moga.mo.gov/statutes/c536.htm>
2. Missouri Rulemaking Manual, Missouri Secretary of State.
<http://www.sos.mo.gov/adrules/manual/manual.asp>
3. Federal Clean Water Act.
<http://epw.senate.gov/water.pdf>
4. Missouri Clean Water Law – Chapter 640.
<http://www.moga.mo.gov/statutes/c640.htm>
5. Missouri Clean Water Law – Chapter 644.
<http://www.moga.mo.gov/statutes/c644.htm>
6. “Draft Missouri Water Quality Standards, 10 CSR 20-7.031”; Missouri Department of Natural Resources; May 3, 2011.
7. “Draft Missouri Water Quality Standards, 10 CSR 20-7.031, Table A1”; Missouri Department of Natural Resources; April 20, 2011.
8. “Draft Missouri Water Quality Standards, 10 CSR 20-7.031, Table A2”; Missouri Department of Natural Resources; April 20, 2011.
9. “Draft Missouri Water Quality Standards, 10 CSR 20-7.031, Table A3”; Missouri Department of Natural Resources; April 20, 2011.

CWA Section 101(a) use designations [10 CSR 20-7.031(2)(A) – (J)]:

10. EPA Water Quality Standards Letter, September 8, 2000.
11. Water Protection Forum – “Water Classification Workgroup Agendas”; Missouri Department of Natural Resources; May 17, 2011.
12. Water Protection Forum – “Small Streams Workgroup, Summary of Discussions on January 15, 2009”; Missouri Department of Natural Resources; January 15, 2009.
13. Water Protection Forum – “Characteristics of unclassified streams sampled by the Resource Assessment and Monitoring Program”; Missouri Department of Conservation; January 15, 2009.

14. Water Protection Forum – “Headwater Stream Aquatic Life Assessment of Aquatic Conservation Opportunity Areas”; Missouri Department of Natural Resources; January 15, 2009.
15. Water Protection Forum – “National Hydrography Dataset (NHD) 1:100,000 Scale”; Missouri Department of Natural Resources; January 15, 2009.
16. Water Protection Forum – “National Hydrography Dataset (NHD) 1:100,000 Scale”; Missouri Department of Natural Resources; February 19, 2009.
17. Water Protection Forum – “Small Streams”; Missouri Coalition for the Environment; February 19, 2009.
18. Water Protection Forum – “Categorical Use Attainability Analysis Proposal”; Missouri Department of Natural Resources; June 17, 2009.
19. Water Protection Forum – “Estimate of Fiscal Impact”; Department of Natural Resources; April 8, 2010.

In addition to the documents referenced above, previous draft and “strawman” versions of the WQS rule can be found on the Water Classification Workgroup web page at the following link: <http://www.dnr.mo.gov/env/wpp/cwforum/adv-uncl-waters-wetlands.htm>

20. ”Notice of Intent to Bring Civil Suit under 33 U.S.C. § 1365 for Failure to Perform Non-discretionary Duty Found in 33 U.S.C. § 1313(c)(3)”; Washington University in St. Louis, School of Law, Civil Justice Clinic, Interdisciplinary Environmental Clinic; August 4, 2010.
21. ”Complaint, Missouri Coalition for the Environment Foundation v. Lisa P. Jackson, Administrator of the United States Environmental Protection Agency; and the United States Environmental Protection Agency; Case 2:10-cv-04169-NKL”; Washington University in St. Louis, School of Law, Civil Justice Clinic, Interdisciplinary Environmental Clinic; August 4, 2010.
22. Map – “Classified Waters, Water Quality Standards Effective Oct. 30, 2009”; Missouri Department of Natural Resources; November 4, 2010.
23. Map – “1:100,000-scale flowline”; Missouri Department of Natural Resources; November 4, 2010.
24. Map – “1:24,000-scale flowline”; Missouri Department of Natural Resources; November 4, 2010.

CWA Section 101(a) use designation definitions [10 CSR 20-7.031(1)(G)]:

25. “Cold Water Stream Information for DNR, Final, April 2011”; Missouri Department of Conservation; April 14, 2011.

26. “MDC Comments, Water Quality Standards, Pre-RIR, April 2011”; Missouri Department of Conservation; April 22, 2011.

Clarification of “Early Life Stages” definition [10 CSR 20-7.031(1)(H)]:

27. “Early Life Stages”; Missouri Department of Natural Resources; October 20, 2006.

In addition to the above, Reference #26 “MDC Comments, Water Quality Standards, Pre-RIR, April 2011” was also used.

Addition of variance authorizing provisions [10 CSR 20-7.031(12)]:

28. Transmittal Letter; “Region 7 Variances to Water Quality Standards Procedural Guidelines”; U.S. Environmental Protection Agency; March 14, 2008.
29. “Early Life Region 7 Variances to Water Quality Standards Procedural Guidelines”; U.S. Environmental Protection Agency; March 14, 2008.
30. “Examples of Variance Authorizing Provisions”; U.S. Environmental Protection Agency; January 22, 2009.

New or revised CWA Section 304(a) numeric water quality criteria [10 CSR 20-7.031, Tables A1, A2, and A3]:

31. “National Recommended Water Quality Criteria, EPA, Office of Water (4304T)”; U.S. Environmental Protection Agency; 2009.
32. “2011 Edition of the Drinking Water Standards and Health Advisories, EPA, Office of Water (EPA 820-R-11-002)”; U.S. Environmental Protection Agency; 2009.
33. “Quality Criteria for Water, EPA, Office of Water (EPA 440-5-86-001)”; U.S. Environmental Protection Agency; 1986.

Revised numeric water quality criteria for phenol [10 CSR 20-7.031, Table A1]:

34. “Ambient Water Quality Criteria for Phenol, EPA, Office of Water (EPA 440-5-80-066)”; U.S. Environmental Protection Agency; October 1980.
35. “Phenol, Ambient Water Quality Criteria, EPA, Office of Water (EPA 823-R-78-005)”; U.S. Environmental Protection Agency; 1978.

36. “Revised National Recommended Water Quality Criteria for the Protection of Human Health: Final Criteria for Acrolein and Phenol, EPA, Office of Water (EPA 822-F-09-001)”; U.S. Environmental Protection Agency; May 2009.
37. “Notice of Availability of National Recommended Water Quality Criteria for Acrolein and Phenol”; Environmental Protection Agency; Federal Register, Vol. 74, No. 110, 27535 – 27536; June 10, 2009.
38. “Petition Requesting Revision to Phenol Water Quality Standard, Associated Industries of Missouri, Petitioner”; Newman, Comley & Ruth P.C. on behalf of Associated Industries of Missouri; October 12, 2010.

In addition to the above, References #31, #32 and #33 were used.

Revised numeric water quality criteria for sulfate and chloride [10 CSR 20-7.031, Table A2]:

39. “Guidelines for Deriving Numerical National Water Quality Criteria for the Protection Of Aquatic Organisms and Their Uses, EPA, Office of Research and Development (PB85-227049)”; U.S. Environmental Protection Agency; 1985.
40. “Ambient Water Quality Criteria for Chloride - 1988 (EPA 440-5-88-001)”; U.S. Environmental Protection Agency; February 1988.
41. “Acute Toxicity of Chloride to Select Freshwater Invertebrates, EPA Contract Number: 68-C-04-006, Work Assignment 4-34, Sub-task 1-15, Final Draft Report”; Great Lakes Environmental Center and Illinois Natural History Survey; October 28, 2008.
42. Fact Sheet, “Revising Criteria for Chloride, Sulfate and Total Dissolved Solids”; Iowa Department of Natural Resources; Accessed March 6, 2009.
43. “Water Quality Standards Review: Chloride, Sulfate and Total Dissolved Solids, Iowa DNR, Consultation Package”; Iowa Department of Natural Resources; February 9, 2009.
44. “Proposed Chloride Criteria Update, Iowa DNR”; Iowa Department of Natural Resources; March 2, 2009.
45. “Petition Requesting Revision to Chloride and Sulfate Water Quality Standards, Missouri Agribusiness Association, Petitioner”; Newman, Comley & Ruth P.C. on behalf of Missouri Agribusiness Association; February 5, 2010.

In addition to the above, References #31, #32 and #33 were used.

Revised numeric water quality criteria for DO [10 CSR 20-7.031, Table A3]:

46. “Ambient Water Quality Criteria for Dissolved Oxygen, EPA, Office of Water (EPA 440-5-86-003)”; U.S. Environmental Protection Agency; April 1986.

In addition to the above, References #31 and #33 were used.

Designation of La Barque Creek, Jefferson Co. as an OSRW [10 CSR 20-7.031, Table E]:

47. “Water Quality Standards Triennial Review, Outstanding State Resource Water Designation Proposal, La Barque Creek Stream Team Association”; Missouri Department of Natural Resources; May 4, 2011.
48. Map, “La Barque Creek Watershed in Jefferson County, Mo., Water Body ID # 2031”; Missouri Department of Natural Resources; May 4, 2011.
49. OSRW Nomination Letter, “RE: Reclassification of LaBarque Creek to Outstanding State Resource Water”; Meyners, C. on behalf of LaBarque Watershed Stream Team Association; July 15, 2009.
50. “LaBarque Creek Watershed Conservation Plan”; Friends of LaBarque Creek Watershed et al. prepared by Meneau, K., Missouri Department of Conservation; October 2009.
51. “LaBarque Creek Watershed Conservation Opportunity Area”; Missouri Department of Conservation; 2005.

Addition of MDC and Other Lakes [10 CSR 20-7.031, Table G]:

52. “The Importance of Sample Discrimination in Using the Travel Cost Method to Estimate the Benefits of Improved Water Quality; Ribaudo, M.O. and D.J. Epp; Land Economics, Vol. 60, No. 4, pp. 397-403; November 1984.
53. “A Comparison of Direct and Indirect Methods for Estimating Environmental Benefits”; Smith, K.V., W.H. Desvousges, and A. Fisher; American Journal of Agricultural Economics, Vol. 68, No. 2, pp. 280-290; May 1986.
54. “Water Quality Affects Property Prices: A Case Study of Selected Maine Lakes”; Michael, H.J., K.J. Boyle, and R. Bouchard; Maine Agriculture and Experiment Station, University of Maine, Miscellaneous Report 398; 1996.
55. “Economic Valuation of Freshwater Ecosystem Services in the United States: 1991-1997”; Wilson., M.A. and S.R. Carpenter; Ecological Applications, Vol. 9, No. 3, pp. 772-783; August 1999.
56. “Predicting Cyanobacteria dominance in lakes”; Downing, J.A., S.B. Watson, and E. McCauley; Canadian Journal of Fisheries and Aquatic Science 58: 1905-1908; 2001.

57. “Relationship of fish catch and composition to water quality in a suite of agriculturally eutrophic lakes”; Egertson, C.J. and J.A. Downing; Canadian Journal of Fisheries and Aquatic Science 61: 1784-1796; 2004.
58. “Measuring the economic value of water quality, the case of lakeshore land”; Steinnes, D.N.; Annals of Regional Science 26: 171-176; 1992.
59. MoCWIS Report, “Revisions Pending Approval, Table G Additions”; Missouri Department of Natural Resources; April 28, 2011.
60. MoCWIS Report, “Revisions Pending Approval, Table G Proposed Use Change”; Missouri Department of Natural Resources; April 28, 2011.

Changes to the designation of WBC and SCR as a result of UAA [10 CSR 20-7.031, Table H]:

61. UAA Report, “Draft 10 CSR 20-7.031, Use Attainability Analyses”; Missouri Department of Natural Resources; May 4, 2011.

In addition to the document referenced above, specific Use Attainability Analysis (UAA) documents and recommendations can be found on the Water Protection Program, Water Quality Standards, Use Attainability Analysis web page at the following link:

<http://www.dnr.mo.gov/env/wpp/wqstandards/uaa/index.html>

Responding to EPA’s October 29, 2009 decision on the Mississippi River [10 CSR 20-7.031, Table H]:

62. “Mississippi River Whole Body Contact Recreation Use Attainability Analysis”; MEC Water Resources Inc. for Metropolitan St. Louis Sewer District; July 2005.
63. “Mississippi River Whole Body Contact Recreational Use Attainability Analysis”; MEC Water Resources Inc. for Metropolitan St. Louis Sewer District; October 11, 2007.
64. “Mississippi River Data – December 2007 Draft”; Tetra Tech Inc. for U.S. Environmental Protection Agency; December 21, 2007.
65. EPA Determination Letter on the Mississippi River from North Riverfront Park to the confluence with the Meramec River; U.S. Environmental Protection Agency; October 29, 2009.
66. DNR Response Letter to EPA Determination Letter; Missouri Department of Natural Resources; January 22, 2010.
67. “Occurrence and Sources of *Escherichia coli* in Metropolitan St. Louis Streams, October 2004 through September 2007”; Wilkison, D.H. and Davis, J.V.; Scientific Investigations Report 2010-5150; U.S. Department of the Interior, U.S. Geological Survey; 2010.

68. “Recommendation Regarding Whole Body Contact Recreation Use Designation for the Mississippi River (Water Body ID: 1707), North Riverfront Park to Confluence with Meramec River”; Missouri Department of Natural Resources; March 10, 2011.
69. “Data Sheet E – Results of Internal Review Committee, Mississippi River, Water Body ID #: 1707.02”; Missouri Department of Natural Resources; March 10, 2011.

Revised delineation and mileages of water body segments [10 CSR 20-7.031, Table G and Table H]:

70. MoCWIS Report, “Revisions Summary of Proposed Revisions – Table G”; Missouri Department of Natural Resources; May 4, 2011.
71. MoCWIS Report, “Revisions Summary of Proposed Revisions – Table H”; Missouri Department of Natural Resources; May 4, 2011.